



FOUR CORNERS GEOLOGICAL SOCIETY NEWSLETTER

March 2007

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Next Meeting and Presentation

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Four Corners Geological Society

March Meeting and Presentation

DATE:

Friday, March 30, 2007

SPEAKER: Dr. Grant A. Meyer, Department of Earth and Planetary Sciences

TOPIC: “Fire, Climate, and Episodic Erosion in the Interior Western U.S. Cordillera”

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

AGENDA:

5:30 – Social Hour, College Union Building, Student Memorial Lounge

6:30 PM Dinner

7:30 PM Presentation

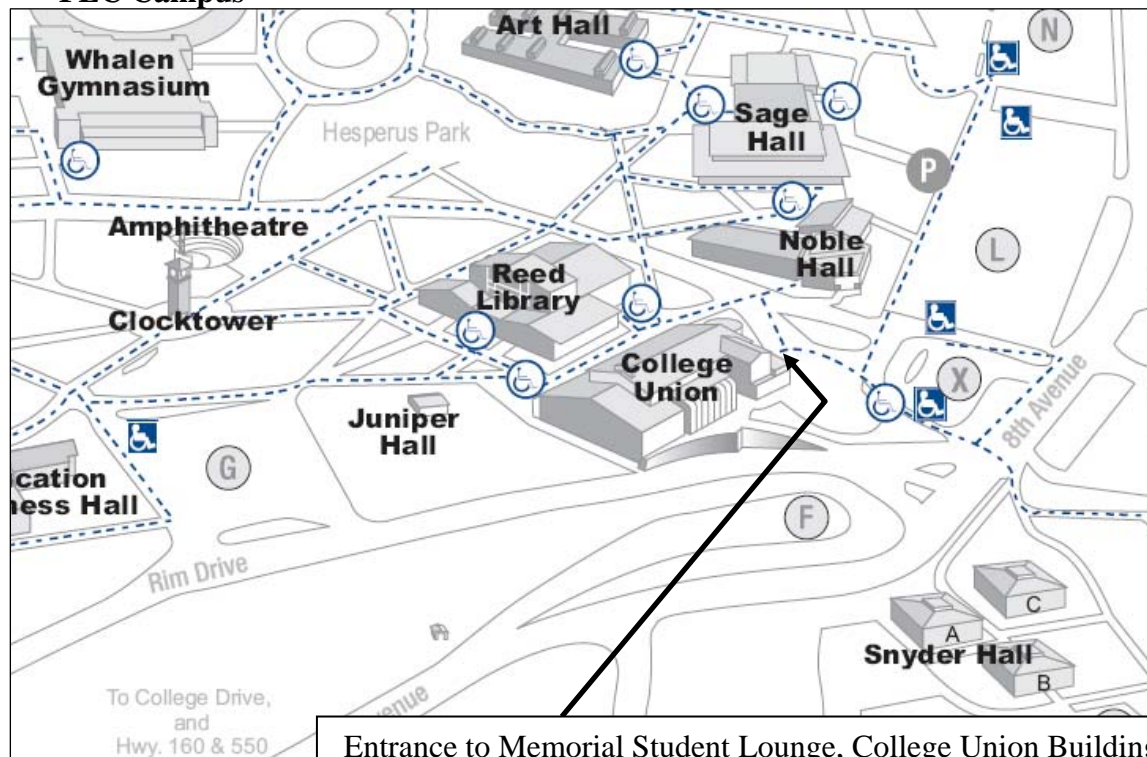
COSTS: \$20.00 per person (dinner and talk), \$2.00 per person (talk only), student’s free (talk only)

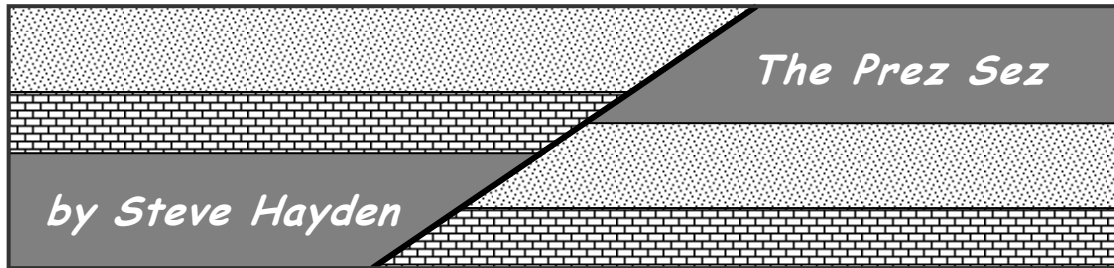
Reservations for this months meeting and presentation should be made by Wednesday, Mar. 28.

Farmington Contact: Steve Hayden – email: steven.hayden@state.nm.us, phone: (505) 334-6178

Durango Contact: Kim Hannula – email: hannula_k@fortlewis.edu, phone: (970) 247-7463

FLC Campus





This month the speaker is Dr Grant Meyer from the University of New Mexico. Grant is a geomorphologist who has studied the effects of fire on the landscape throughout the west. He did his PhD in Yellowstone after the devastating fires denuded large areas a couple of decades ago. I highly recommend everyone attend his talk. His scope ties in climate cyclicity, fire severity and sedimentation/erosion rates. This topic has much local application after the fire seasons in Colorado and New Mexico over the last several years.

Grant is also a great guy and a fly fisherman without peer.

I hope to see you all at Fort Lewis on the 30th.

Joe Hewitt has sent a review of the FCGS Foundation finances for inclusion in this newsletter. We appear to be doing very well on that front. Our accountants would like to see more small donors, as the IRS looks for these in non-profit organizations like ours. Anyone that would like to set up a small donation (\$20.00 would not be too small) should contact Joe or me.

Steve



Fire, Climate, and Episodic Erosion in the Interior Western U.S. Cordillera

Dr. Grant A. Meyer
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Albuquerque, NM 87131
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ABSTRACT

Many studies have documented extreme transient increases in erosion rates following severe forest fires in mountain regions, resulting from dramatic increases in surface runoff generation and soil erodibility combined with smooth overland flow paths. With intense precipitation, widespread runoff leads to rill and gully incision, sediment bulking and debris-flow transport. Postfire erosion also stems from loss of root strength leading to large colluvial failures and other mass movements such as dry ravel, depending on the climatic and geomorphic setting. For example, postfire mass failures in central Idaho yielded up to 44,000 Mg km⁻² from small basins, equivalent to several thousand years of sediment yield at low rates measured over a few decades in unburned watersheds. Erosion by storm events is often modeled as a stochastic process, but drought and fire are not random; like storms, they are often strongly clustered in time because of climatic controls.

Increased wildfire activity has accompanied late 20th-century to present warming across the diverse conifer forests of western North America. In ponderosa pine forests in particular, large, severe wildfires and ensuing erosion and debris flows appear unprecedented in light of tree-ring fire-scar records, and are often attributed to increased stand density following Euro-American settlement and fire suppression starting in the late 1800s. Yet, presettlement periods in fire-scar records correspond to mostly cooler Little Ice Age climates, when we expect that severe fires may be less probable. AMS ¹⁴C dating of fire-related alluvial-fan deposits provides a longer-term context for assessing links between fire, climate, erosion, and anthropogenic change. Despite contrasts in climate, forest types, and characteristic fire regimes, severe multidecadal droughts during the Medieval period 1050-650 cal yr BP produced large fire-related debris flows in subalpine Yellowstone, drier ponderosa-mixed conifer forests in central Idaho, and mixed-conifer forests in the monsoonal climate of the Sacramento Mountains, New Mexico. In central Idaho, fire-related debris-flow deposits from the Medieval period make up ~25% of the sampled fan deposit thickness over the last 4000 yr. In both Yellowstone and the Sacramento Mountains, very rapid fan aggradation between ~5500 and 4000 cal yr BP implies the highest slope erosion rates following the Pleistocene-

Holocene transition. Fire-induced deposits comprise ~30% of late-Holocene fan alluvium in Yellowstone, where extremely steep and erodible unvegetated volcanoclastic bedrock also contributes, and ~50% in central Idaho, where fire is key to mobilizing grussy colluvium. An unanswered question is whether long-term changes in fire regime linked to major climate changes also alter overall mountain denudation rates.

As greenhouse gas increases are virtually assured over the next century, impacts on fire and erosion have likely just begun. Earlier snowmelt accompanying warming lengthens the fire season in much of the Rocky Mountains, including YNP, central Idaho, and Colorado (Westerling et al. 2006). In ponderosa and similar forests where surface fires were suppressed by humans, increased stand density compounds the effect of warming. Increasing temperatures may also heighten precipitation intensity, producing greater postfire erosion. Although Holocene history provides imperfect analogs for a uniquely anthropogenic future, the sensitivity of fire regimes to past warming portends future increases in severe fires and geomorphic change.

SPEAKER BIOGRAPHY

Dr. Grant A. Meyer

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Web page: <http://epswww.unm.edu/facstaff/gmeyer/home.htm>

Educational history:

B.S. Geology, 1978, University of Idaho, Moscow

M.S. Earth Science, 1986, Montana State University

Thesis: Genesis and deformation of Holocene shoreline terraces, Yellowstone Lake, Wyoming

Ph.D. Geology, July 1993, Department of Earth and Planetary Sciences, University of New Mexico

Dissertation: Holocene and modern geomorphic response to forest fires and climate change in Yellowstone National Park

Post-PhD employment history:

Associate Professor, 2003-present, Dept. of Earth & Planetary Sciences, University of New Mexico.

Assistant Professor, 2000-2003, Dept. of Earth & Planetary Sciences, University of New Mexico.

Assistant Professor, 1999-2000, Department of Geography, University of Oregon.

Assistant Professor, 1993-1999, Department of Geology, Middlebury College, Vermont.

Selected publications:

- Persico, L.P., and Meyer, G.A. (in review), Relations between beaver, fluvial geomorphology, and climate over the Holocene in Yellowstone National Park, Wyoming: *Quaternary Research*.
- Amerson, B.E., Montgomery, D.R. and Meyer, G.A. (in revision), Relative size of fluvial and glaciated valleys in Central Idaho: *Geomorphology*.
- Pierce, K.L., Cannon, K.P., Meyer, G.A., Trebesch, M.J., and Watts, R. (in press), Post-glacial inflation-deflation cycles, tilting, and faulting in the Yellowstone caldera based on Yellowstone Lake shorelines: *U.S. Geological Survey Professional Paper*.
- Persico, L. Meyer, G., Frechette, J., New, J., and Hepler, C. (2005) Contrasts in late Pleistocene to Holocene fluvial behavior along the middle Rio Chama: New Mexico Geological Society, 56th Field Conference Guidebook, Geology of the Chama Basin, p. 432-433.
- Pierce, J.L., Meyer, G.A., and Jull, A.J.T. (2004) Fire-induced erosion and millennial-scale climate change in northern ponderosa pine forests: *Nature*, v. 432, p. 87-90.
- Meyer, G.A. (2004) Yellowstone fires and the physical landscape, Ch. 3 in Wallace, L.L., ed., *After The Fires: The Ecology of Change in Yellowstone National Park*: New Haven, Yale University Press, p. 29-51.
- Meyer, G.A., Fawcett, P.F., and Locke, W.W. (2004) Late-Pleistocene equilibrium-line altitudes, atmospheric circulation, and timing of mountain glacier advances in the interior northwestern United States, in Haller, K., and Wood, S.H., eds., *Geological Field Trips in Southern Idaho, Eastern Oregon, and Northern Nevada*: Geological Society of America Field Guide, p. 61-66.
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- Meyer, G.A., and Leidecker, M.E. (1999) Fluvial terraces along the Middle Fork Salmon River, Idaho, and their relation to glaciation, landslide dams, and incision rates: A preliminary analysis and river-mile guide, in Hughes, S.S., and Thackray, G.D., eds., *Guidebook to the Geology of Eastern Idaho*, Pocatello, Idaho Museum of Natural History, p. 219-235.
- Meyer, G.A., and Wells, S.G. (1997) Fire-related sedimentation events on alluvial fans, Yellowstone National Park, U.S.A., *Journal of Sedimentary Research*, v. A67, p. 776-791.
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- Locke, W.W., and Meyer, G.A. (1994) A 12,000-year record of vertical deformation across the Yellowstone caldera margin: The shorelines of Yellowstone Lake, *Journal of Geophysical Research*, v. 99, n. B10, p. 20,079-20,094.
- Balling, R.C., Jr., Meyer, G.A., and Wells, S.G. (1992) Climate change in Yellowstone National Park: Is the drought-related risk of wildfires increasing? *Climatic Change*, v. 22, p. 34-35.
- Locke, W.W., Meyer, G.A., and Pings, J.C. (1992) Morphology of a post-glacial fault scarp across the Yellowstone (Wyoming) Caldera margin and its implications, *Bulletin of the Seismological Society of America*, v. 82(1), p. 511-516.
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General Announcements/News from other Geo-Societies

American Association of Petroleum Geologists

The AAPG Annual Convention and Exhibition will be held **April 1-4, 2007** in Long Beach, California. The theme of the Conference is, "Understanding Earth Systems, Pursuing the Checkered Flag. The Final Announcement has been published, listing sessions, speakers, short courses and fieldtrips. Go online to <http://www.aapg.org> for more information or to register.

Call for abstracts for the 2007 AAPG Rocky Mountain Section Meeting, to be held **October 6-9** at Snowbird, Utah. The meeting will be hosted by the Utah Geological Association. Abstracts must be 250 words or less and are due by April 20th. Electronic abstract submittal details are posted at: www.utahgeology.org/rms-aapg.htm. The technical program co-chairs are David Lambert, GL1253@msn.com / (801) 953-3373 and Rich Newhart, richardnewhart@questar.com / (801) 324-2090.

Arizona Geological Society

The AGS is (still) planning their AGS Ores & Orogenesis Symposium for **September 24-30th, 2007**. Go to www.agssymposium.org to submit an abstract or for more information.

Arizona Geological Survey

AZGS has just published Vol. 36, No. 3 of their publication, "Arizona Geology". This issue, authored by Philip A. Pearthree and Ann Youberg covers recent debris flows and floods in southern Arizona triggered by rains in July, 2006. To request a subscription write to AZGS / 416 West Congress Street, Suite 100 / Tucson / Arizona 85701, or call 520-770-3500, Fax 520-770-3505 or visit their website at www.azgs.az.gov.

Geological Society of America

The GSA Annual Meeting will be held **October 29-31, 2007** at the Colorado Convention Center in Denver, Colorado. For more information visit www.geosociety.org.

Petroleum Recovery Research Center

The PRRC has just rolled out their revised GO-TECH website, which is now more flexible, easier to navigate and accesses more information. GO-TECH stands for Gas and Oil Technology Exchange and Communication Highway. The site has a huge offering of NM production and water data, tied to GIS maps. To check it out, go to: <http://octane.nmt.edu>. PRRC is a division of the New Mexico Institute of Mining and Technology.

Southwest Hydrology and Arizona Hydrological Society

Call for abstracts for the 2007 Regional Water Symposium to be held **August 29-Sept 1, 2007** at the Westin LaPaloma Resort & Spa in Tucson, Arizona. The theme of the symposium is, "Sustainable Water, Unlimited Growth, Quality of Life, Can We Have it All?". The deadline to submit abstracts is February 2, 2007. Visit their website, www.watersymposium.org, to submit an abstract or propose a session.

Rocky Mountain Association of Geologists

The Coalbed Methane Symposium will be held **June 4th, 2007** at the Marriott City Center Hotel in Denver, Colorado. The symposium is sponsored by the RMAG and the Denver Geophysical Society. For more information contact Bruce Kelso, bsk@bry.com, 303-825-3344 or Bob Lamarre, lamarregeo@quest.net, 720-488-1396. This is NOT the same meeting as the Strategic Research Institute's 8th Annual Coal Bed Methane Conference below on March 29-30.

The RMAG is notifying their members of the RMS-SEPM fieldtrip to be held **June 21-24, 2007**. The topic is Sequence Stratigraphy and Reservoir Characterization of the Middle Mesaverde Group: Genetic Linkage from Rock Springs Uplift (Wy) to Sand Wash Basin (Co) to Middle Park Basin (Co). Leaders will be Ron Steel, UT Austin and Jeff Crabaugh, Exxon Mobil.

Strategic Research Institute

The 8th Annual Coal Bed Methane Conference will be held **March 29-30th, 2007** at the Marriott Hotel, Cherry Creek in Denver, Colorado. The featured CBM experts include Jayne Somers (U.S. Environmental Protection Agency), Peet M. Soot (CMM Energy LLC), Ron Barnes (Pinnacle Gas Resources), Bj Kristiansen (CBMCC), Charlee Bergamo (Raven Ridge Resources, Inc.) and Richard Kithil, Jr. (National Lightning Safety Institute). For more information and to register go online to www.srinstitute.com/cbcm or call 800-599-4950 or 212-967-0095. Or write to Strategic Research Institute / 333 Seventh Avenue, 9th Floor, New York, New York 10001. Or send a fax to 212-967-8021. This is NOT the same meeting as the RMAG's Coal Bed Methane Symposium above on June 4th.

David V. Grey Geologist/Geophysicist	
UPSTREAM ENERGY CONSULTANTS, LLC Geology, Geophysics, Reservoir & Economic Analysis 970-731-2908	
60 JJ Junction Pagosa Springs, CO 81147	Cell: 970-946-5787 dgrey1129centurytel.net

Wyoming Geological Association

The theme of the 2007 WGA Field Conference, to be held **August 2-6, 2007**, will be, "The Powder River Basin: From the Margins Looking In". Field trips will circle the basin with excursions to the interior. Stops will include, but are not limited to, uranium solution mining, coal extraction, the Hot Springs Mammoth Site, outcrops on the west flank of the Black Hills, the Newcastle "Oil Mine", coalbed methane surface facilities, Salt Creek and the Teapot Dome. In conjunction with the Field Conference, the WGA plans to publish a guidebook entitled, "Wyoming Geology" and welcomes submissions on subjects preferably, but not necessarily consistent with, the theme of the conference. The **deadline for submission is March 1, 2007**. Abstracts should be e-mailed to jlawlor@gga-inc.com, phone (307) 265-9199. The Conference Chairman is Mark Milliken.

The **Fort Lewis College Geology Department has been publishing a newsletter every summer and those who are not already receiving it are encouraged to contact Darren Cookus at cookus_d@fortlewis.edu

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Have you paid your 2007 dues?

Our society dues are payable December through March for each calendar year. This confuses many members because our dinner meetings run during the colder months, from September through May, spanning two calendar years and thus two dues payments. If you joined or renewed in September, you paid for the end of 2006 and your membership does not continue into 2007 unless you paid your 2007 dues.

Our bylaws (Article VIII. Dues) state that “any member whose dues are not paid by January 1st shall be considered delinquent”. “Any member whose dues are in arrears for more than sixty (60) days shall be suspended from membership in the society and shall not be entitled to the privileges of membership.” Please don’t let that happen to you!

The following is a list of members who are paid up for 2007 and/or are Student, Honorary, Emeritus or Complimentary members. **If you do not see your name on this list, this is the last newsletter you will receive until you renew your membership.** If you believe you have already paid your dues but you do not see your name on this list, please contact Kim Gerhardt, FCGS Secretary, 35 Michael Way, Durango, Colorado 81301 / 970-375-2700 / kim@mydurango.net.

Attebery	Ralph Tucker	Active / Associate
Ayers	Walter B.	Active / Associate
Balkema	Brent	Active / Associate
Bircher	John E.	Active / Associate
Blair	Robert B.	Active / Associate
Brame	Jeffrey	Active / Associate
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Witcher	James C.	Active / Associate
Attebery	Ralph Tucker	Active / Associate

Bowman	Frank O.	Honorary / Emeritus
Fassett	Jim E.	Honorary / Emeritus
Lilly	Mike	Honorary / Emeritus
Matheny	Marvin L.	Honorary / Emeritus
Peterson	James A.	Honorary / Emeritus
Smith	Kenneth T.	Honorary / Emeritus
Thomaidis	Nick	Honorary / Emeritus
Thurston	William R.	Honorary / Emeritus
Ullrich	Richard A.	Honorary / Emeritus

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Utah Geological Association	Complimentary
Wyoming Geological Association	Complimentary

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Marsters	Meghan	Student
Moore	Jon	Student
Newman	Daniel	Student
Phelps	Chris	Student
Slack	Trever Z.	Student
Stetson-Lee	Tor	Student
Swanson-Theisen	Minna	Student
Thompson	Mike	Student

2006 Foundation Treasurer's Report

A review of the Four Corners Geological Society Foundation 2006 Treasurer's report indicates a sound financial condition for the Foundation.

In 1997 the Society set up and funded the Foundation with \$60,000 that has now grown to over \$67,000. In the past 11 years over \$22,000 has been given as grants to qualified and deserving master thesis applicants. With your continued support the foundation funds will grow to finance additional grants and other worthwhile endeavors.

On behalf of the Foundation Officers thank you all for your generous donations and support.

Joe Hewitt -Foundation Treasurer

2006 FCGS Foundation Treasurer's Report

1/24/07

Assets: Wachovia Security:	26,350
Well Fargo Bank:	40,970
total	\$ 67,320.00

Expenditures:	
Masters Thesis Scholarship	1000.00
FLC student assistance	500.00
Tax Preparation	257.00
total	\$ 1,757.00

Income: Wachovia Security:	bond income & money market	1435.15
Well Fargo Bank:	checking interest	14.62
	CD interest	1139.39
total		\$ 2,589.16

Donations/Contributions:	total	\$ 1,565.00
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Four Corners Geological Society

MEMBERSHIP RENEWAL or APPLICATION for 2007

PAGE 1

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Four Corners Geological Society

MEMBERSHIP RENEWAL or APPLICATION for 2007 PAGE 2

My professional interests are:

I would like to include a Tax Deductible Contribution to the Four Corners Geological Society Foundation.

Amount of Donation: _____
(Please include a separate check made payable to the Foundation.)

In Memory of (optional): _____

To be used for (optional): _____

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The dues year begins on January 1.
For dues paid after March 1, add a \$5 late fee (does not apply to new members).

Please print, complete and return **both pages** of this form with your check for dues made payable to:

**Four Corners Geological Society
P.O. Box 1501,
Durango, CO 81302**

Advertising rates for the Four Corners Geological Society newsletter:

Full Page Ad (7½" x 9½") \$100/mo. or \$1000/yr. Half Page Ad (7½" x 4½") \$50/mo. or \$500/yr.
¼ Page Ad (3½" x 4½") \$25/mo. or \$250/yr. Business Card (3½" x 2") \$10/mo. or 100/yr.

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

For more information, please contact the FCGS Treasurer, (vacant). 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

<http://www.canyonwinds.com/FCGS/index.html>

2006-07 Officers

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