

# ASSOCIATION OF ENGINEERING GEOLOGISTS

*"Serving Professionals in Engineering, Environmental, and Ground-Water Geology"*

## THE ROCKY MOUNTAIN SECTION NEWSLETTER

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

### MEETING DATE

THURSDAY  
SEPTEMBER 16<sup>th</sup>, 2004

### TIME

5:45 p.m. Social Hour  
6:30 p.m. Dinner  
7:30 p.m. Presentation

### LOCATION

**BERTHOUD HALL**  
**2<sup>nd</sup> Floor**  
Colorado School of Mines  
Golden, CO  
See map below

### COST

\$20 Members  
\$22 Non-members  
Free for Students first  
time, \$10 then after

### RESERVATIONS

c/o AEG Reservation Line  
(303) 790-2161 x 243 or  
[meetings@aegrms.org](mailto:meetings@aegrms.org)  
**BY NOON, TUESDAY**  
**SEPTEMBER 14<sup>th</sup>**

### **The Neogene Faulting of Colorado's High Plains – Regional Evidence and Field Results from the Anton Scarp Trench**

Vince Matthews and David Noe, Colorado Geological Survey, Denver,  
Colorado

James McCalpin, GEO-HAZ Consulting, Inc., Crestone, Colorado

Neogene uplift of the Colorado Rockies was accomplished by faulting. Historically, coeval tilting of the Great Plains was considered to involve only broad warping. However, several lines of evidence indicate that Neogene and Quaternary faulting may be an important deformational component in the Great Plains of Colorado. A digital elevation model reveals a graben-like feature 40 kilometers wide bounded by scarps 20 to 30 meters high. The graben is expressed in the surface morphology and subsurface structure. The western scarp trends N35W and is at least 135 kilometers long, extending from 28 km south of Akron to 25 km north of Cheyenne Wells. Four different lines of evidence suggest that the western scarp may be underlain by a fault having a strike-slip component: 1) linearity of the scarp, 2) presence of a left-stepping segment of the fault, 3) presence of two synthetic, Riedel shears splaying off the main scarp, and 4) presence of four left-lateral, stream offsets of 1.6 km each. Geomorphologic and geologic analysis of the Colorado High Plains reveals a number of horst and graben structures throughout the area. Stream profiles show strong to moderate incision on the horsts and probable aggradation in the grabens. The potential presence of younger faults in Colorado's High Plains has significance for groundwater resources, earthquake hazard, and hydrocarbon exploration and development.

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During June-August, 2004, Colorado Geological Survey and GEO-HAZ, Inc. conducted fieldwork on the western scarp, informally known as the “Anton scarp,” to investigate the origin and age of this mysterious landform. At the trench site, the scarp is 25 m high, about 200 m wide, and has a maximum slope angle of seven degrees. Fieldwork included scarp profile measurement, a GPR survey, a refraction seismic survey, trenching and trench wall logging, borehole drilling and core logging, and sampling for age dating. A 180 m long, 4.5-6.0 m deep, four-level trench was dug down the fall line of the scarp beginning at the crest. The trench exposes 22 meters of stratigraphic section, almost all of which dips gently to the west and thus is truncated by the scarp. However, no direct evidence of faulting was found in the trench. Continuous cores of up to 12 m deep were drilled along the trench, and to the east within the graben, to extend the depth and lateral extent of lithofacies correlations in an attempt to find stratigraphic offsets or interruptions. The results from the second-phase coring investigation will be reported at the AEG-RMS presentation. Did we find the fault? Stay tuned.



The stratigraphic detail provided by the trench and cores is extraordinary for the High Plains region. Together with the results from C-14 radiocarbon and thermoluminescence dating, the study has allowed us to take an insightful look at the stratigraphic evolution of Colorado’s High Plains.

## Words From the Chair

Welcome back! The summer is almost over and now its time to convene again with our peers. Hope all have had a prosperous and productive summer. Another exciting year is on hand with Ben Arndt with Yeh and Associates taking over as Chair in October. This meeting should be a good one, as David Noe of the Colorado Geological Survey will be presenting on the "excavation" that made prime time news about a month ago at the Anton Scarp in Eastern Colorado.

As you all may know, we lost our treasurer, Paula LeMonds, as she took a job in Austin, Texas. We are close to having a replacement, but as with any volunteer organization, your support is what makes AEG an effective organization for all. Anyone who wants to be more involved, please contact either Ben or myself. It's a great opportunity to be recognized by all your peers. And with the new Mission, Vision and Values statements, volunteerism will be as important as ever. Lets make the Rocky Mountain Section the leader as AEG moves forward to meet its goals to have AEG be recognized as the international leader in engineering geology just as ASCE is to civil engineering.

Please note the announcement for the 2004 geotechnical seminar co-sponsored by AEG that will be held in October. And I also hope to see a strong Rocky Mountain Section showing in Dearborn at the annual meeting. I know I'll be there.

## New Webmaster

Our plea for help with the webpage has been answered. Jill Carlson with CGS is the new webmaster. A big thanks to Jill for picking up this task! If you have anything you would like to post on the website, please contact Jill.



## Geotechnical Group Hosts Conference that Highlights Geotechnical Engineering for Water Resources Projects

Friday, October 22, 2004 the Geotechnical Group is hosting it's biennial seminar, entitled: **"H2GEO: Geotechnical Engineering for Water Resources."** The seminar will be a single-track, one-day event with sessions on Dams, Flood Hydrology, Underground, and Wells and Reservoirs. Dams discussed will include: Guanella, Washakie, Green Ridge Glade, and Pueblo. Flood hydrology includes projects along the Missouri River, the Snake River, Dry Creek, and fire-burned areas. The underground session will explore the St. Johns Tunnel, the Burlington Mine, the Pinery Dam Outlet Conduit, and 3-D modeling of a shaft station. The final session on wells and reservoirs will feature: Brighton's new water well, drilling fluid loss in Denver basin aquifers and conversion of gravel pits and rock quarries into municipal reservoirs. The luncheon will feature Ken Wright discussing Prehistoric Reservoirs of Mesa Verde. Exhibits by companies and sponsor organizations will be displayed during all breaks. The seminar will be at the Radisson Hotel at Stapleton Plaza, located at 3333 Quebec St., Denver. Registration will be available online starting in mid August and at the door, (7:00 am), for \$140 (includes breakfast, lunch, coffee, and proceedings). Register early (prior to Sept. 21) for \$110. Students can register for \$35. The conference is co-hosted by Association of Engineering Geologists and the Colorado Association of Geotechnical Engineers. The ASCE Geo Institute will be publishing the proceedings. See the section's web page for more details, [http://sections.asce.org/colorado/conference\\_hm.html](http://sections.asce.org/colorado/conference_hm.html).

## **Your Business Card Here**

The section is looking for companies or individuals who would like to advertise their products or services in the section newsletter and on the website. This is anything from a business card (\$10/month), quarter page spread (\$20/month), to a half page exposition (\$40/month). If you are interested, contact Kristi Ainslie [newsletter@aegrms.org](mailto:newsletter@aegrms.org).

## **Case Histories**

The past two years, we have read about very interesting projects from Harry Siebert and Charlie Robinson. We are still looking for individuals to provide their knowledge and experience to the AEG-RMS community through case histories and articles of interest. Please contact Kristi Ainslie at [newsletter@aegrms.org](mailto:newsletter@aegrms.org) if you have anything you would like to share.

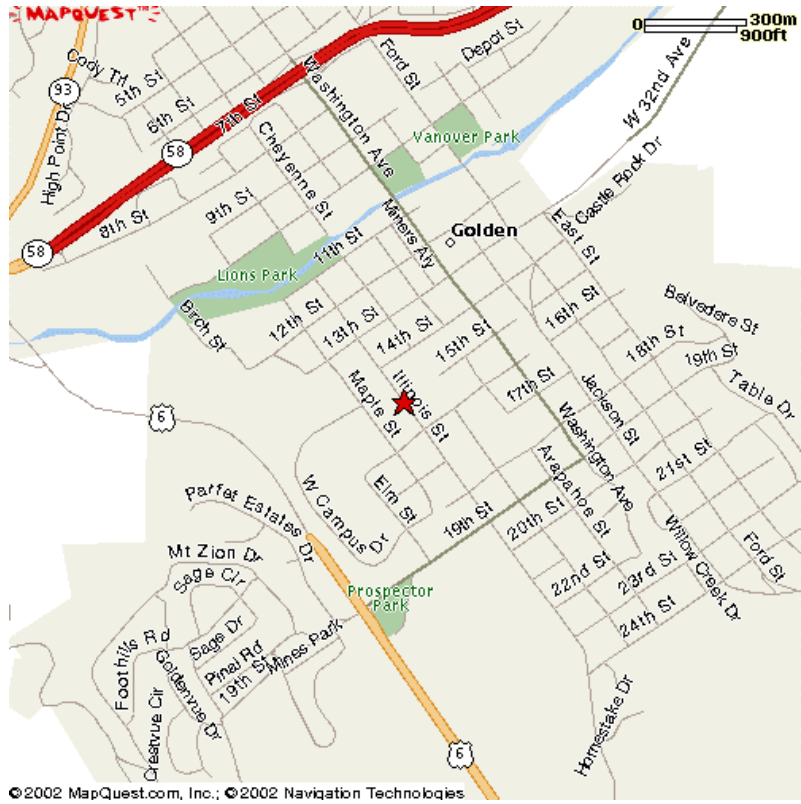
## **Parting Words**

Welcome back to another great year for AEG-RMS. Hopefully everyone had a great summer and is ready for some great talks this year.

As the annual meeting approaches, it means it is time to usher in new members to our local board of directors and bid a fond farewell to Darin Duran who did an exceptional job of guiding the section after Vail last year. Most years after an annual meeting is held, attendance at the monthly meetings slightly drops. Last year we were able to maintain good numbers and exciting talks.

Ben Arndt will be assuming the chair after the annual meeting. As you may have noticed, there are still some blanks in our board of directors list, which we hope to fill after the first meeting.

The Editors  
Kristi Ainslie (formerly McQuiddy)  
Ed Friend



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