

NOVEMBER 2019 NEWSLETTER

FOUR CORNERS GEOLOGICAL SOCIETY

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NOVEMBER LUNCHEON MEETING

- SPEAKER:** Paul Spear, Formerly Logos Resources and ConocoPhillips
- TITLE:** Helium in the Four Corners Region - History, Geology and Recent Activity
- DATE:** Thursday, November 21st
- LOCATION:** San Juan Country Club, 5775 Country Club Drive, Farmington, NM
- TIME:** Social 11:00-11:30, Lunch 11:30-12:00, Talk 12:00-1:00
- COST:** \$20pp with RSVP by deadline, \$25 post deadline and while food lasts, \$2pp talk only.
- STUDENTS:** The first 4 students to contact Dr. Gary Gianniny (Gianniny_g@fortlewis.edu) can attend for free.
- RSVP:** By Tuesday, November 19th at 5pm to Sabina Kraushaar (smkraushaar@gmail.com) or online: <https://fourcornersgeologicalsociety.org/> .

A BIG Thanks
to **David Thomas**
for sponsoring 4
Student Dinners
this month!

Remains of stamp mill in Maggie Gulch
September 2019, Kim Gerhardt



Four Corners Geological Society, P.O. Box 1501, Durango, CO 81302
www.fourcornersgeologicalsociety.org

Save the Date!

December 12th @ TBD

January 16th @ TBD

February 20th @ TBD

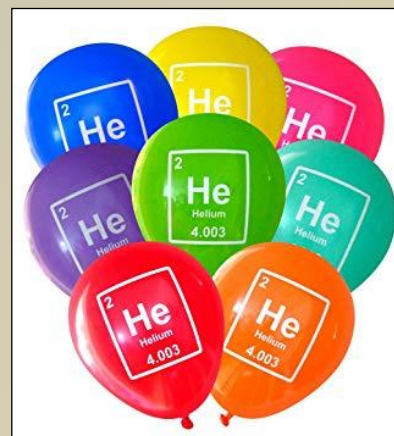
March 12th @ TBD

April 16th @ FLC:
Graduating Seniors present
Senior Theses.

April 30th @ TBD

ABSTRACT: There has been helium exploration and production since the early 1940's within the Four Corners region. This inert gas has very unique properties due to its small atomic size and has many uses including cryogenics, pressure/purge systems, controlled atmospheres, welding, leak detection, breathing mixtures, party balloons, and the most important use - impressing your friends by imitating Alvin the Chipmunk! With increasing industrial demand, the U.S. government supporting the eventual complete privatization of the helium supply, and the subsequent draw down on the federal reserve, the price per thousand cubic feet (Mcf) has skyrocketed within the last few years. The BLM reported average crude helium gas price for the fiscal year 2019 to be \$95/Mcf. In their latest helium auction for 2019 volumes, a total of 210 MMCF in 12 lots was sold for a

whopping \$58,790,000! With prices like that, helium may again be an economic drilling target right here in our backyard. In this presentation we will investigate historic helium activity through the literature of the Four Corners Geological Society, discover the geologic conditions required for successful helium exploration, scout current operator activity, and discuss the future exploration potential of helium in the Four Corners.



Mad Science Party Balloons
by Nerdy Words on Amazon

BIOGRAPHY: Paul Spear, Formerly Logos Resources and ConocoPhillips



Paul Spear awarding horseshoe
tournament prize to Chip Head at
FCGS Picnic. August 2016.

Paul Spear is a veteran oilfield professional with more than twenty years of industry experience. He began his career in 1993 at Ft. Lewis after service in the US Army during the Gulf War and then South Korea. Directly following undergraduate school in 1997, Paul took a field position with Rocky Mountain Geo-Engineering (RMGE) as a mudlogger and well site geologist. RMGE was later purchased by Pason Systems USA and Paul continued his field work within the Rockies. In 2005, he started a position as a geotechnician with Burlington Resources (BR) in their San Juan Business Unit in Farmington, NM. In 2006, BR was bought by ConocoPhillips (COP) and Paul stayed with COP where he was ultimately promoted to Senior Geologist. During that time, he worked on many high-profile projects including Fruitland Coal HZ development, Mesaverde Group and Dakota Formation resource assessments utilizing advanced geostatistical modeling techniques, and was the acting petrophysicist for the ConocoPhillips

Mancos SH team. In 2015 Paul accepted a position with Logos Resources II, LLC and was the sole geologist throughout their growth phase until mid-2018. Paul is currently living and working in Aztec, NM as a consulting geologist while seeking a new full-time opportunity. Utilizing IHS PETRA and QGIS software, Paul Spear is available to assist with projects in multiple states including NM, CO, UT, WY, and TX.



“PREZ SEZ” by Sabina Kraushaar



We had a sensational talk last month by John Lorenz and Scott Cooper about structural geology work they've done in a variety of oil and gas basins. The room didn't clear out until nine pm and we had a great turnout, with another excellent raffle by Tom Staatz. Thank you to everyone who was able to attend

and to Fort Lewis College for hosting us!

Please come out for our upcoming talk on Thursday, November 21st, the week BEFORE Thanksgiving, over lunch at the San Juan Country Club in Farmington, NM. We have invited Paul Spear (former petroleum geologist for Logos Resources and ConocoPhillips) to talk to our membership about helium exploration and current activity in the Four Corners area. It should be very relevant and interesting.

I've been reading and thinking about energy trends lately and thought I'd discuss a little. My grandfather taught nuclear physics at Colorado University in Boulder, and wrote a textbook in 1993 titled: "Energy and the Environment". In the first edition, he predicted peak oil - where demand of oil would decrease because we would run out the finite resource. Predicting the future of energy is notoriously difficult, and as it has turned out, peak oil hasn't happened due to advances in technology such as horizontal drilling and hydraulic fracking.

Most data suggest that global demand for oil and gas will rise for at least another decade, and then it becomes less clear what will happen. Oil giant BP suggests in their Energy Outlook that "Renewable energy is the fastest growing source of energy, contributing half of the growth in global energy supplies and becoming the largest source of power by 2040." BP predicts that the peak demand for oil will be in the late 2030's (read the report here: BP Energy Outlook). Others disagree, and there are a variety of scenarios that depend on government action to mitigate climate change risks and the economics of renewable energy.

Regardless, I've been pondering what business opportunities lie ahead in the next 20-30 years. AAPG recently held a forum called "The Energy Transition Forum: A New Era for Geoscientists." Here are a few of their suggestions for students and younger geoscientists: data will be key, so learning data science skills such as Python will be helpful, many skills are transferable from O&G to alternative energy (carbon capture and storage, geothermal, lithium for battery storage, soil stability for wind/solar farms), and collaboration across industries, disciplines and software will be important. You can read more here: AAPG Energy Transition Forum.

Thanks for reading and thank you for being a member of the Four Corners Geological Society! A HUGE thank you to our volunteer board, Kim Gerhardt, Tom Ann Casey, Tim Rynott, Jim Corken, Jonathan Harvey, Tom Staatz, Rachel Medina and Jolin Cordalis. Hope to see you in Farmington on November 21st!

Sabina

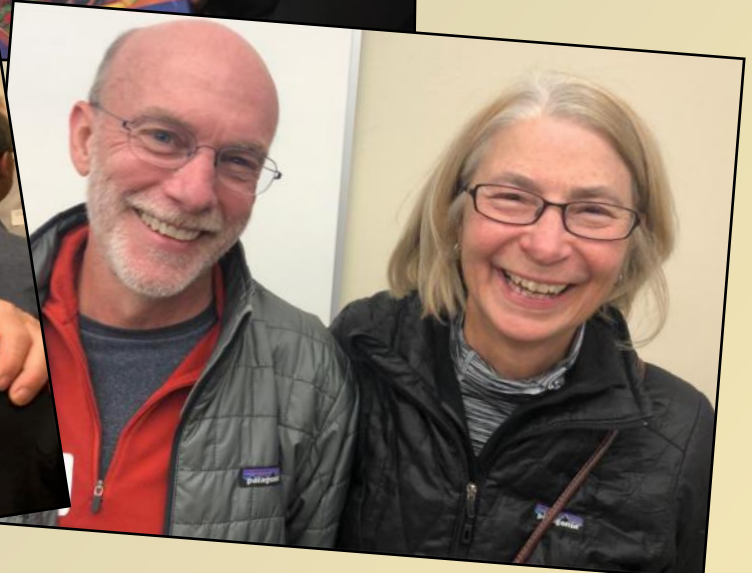
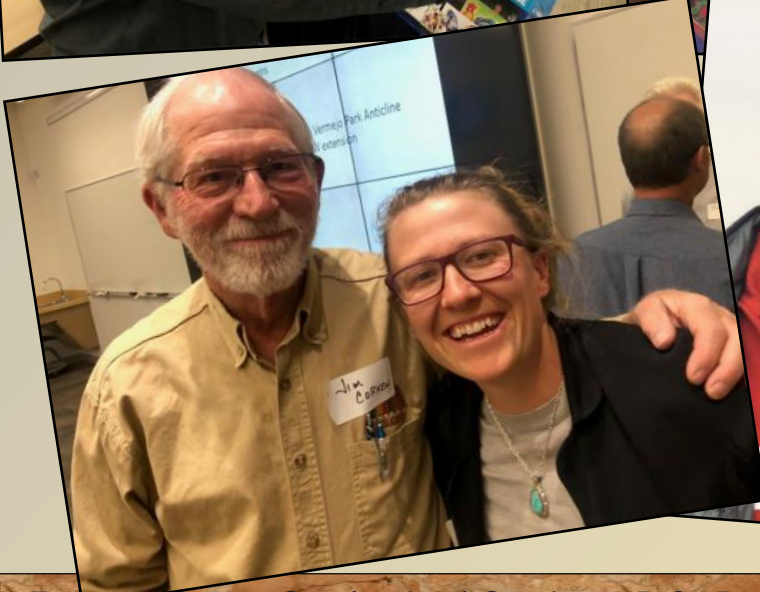
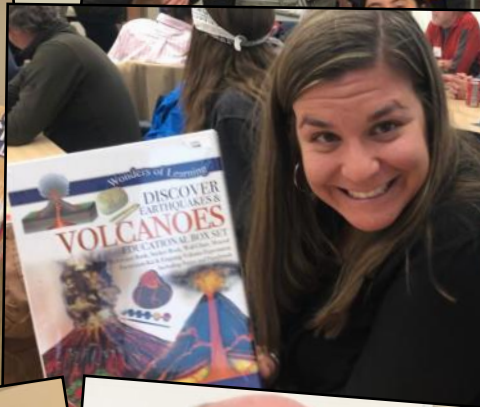
Maggie Gulch, September 2019
Kim Gerhardt



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OCTOBER MEETING

with Dr. John Lorenz and
Scott Cooper

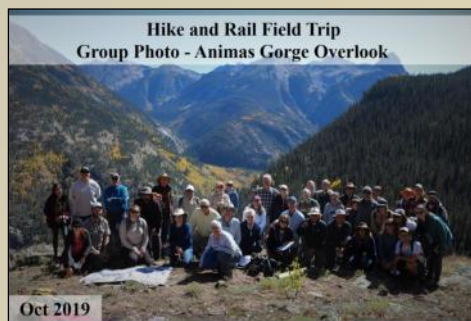
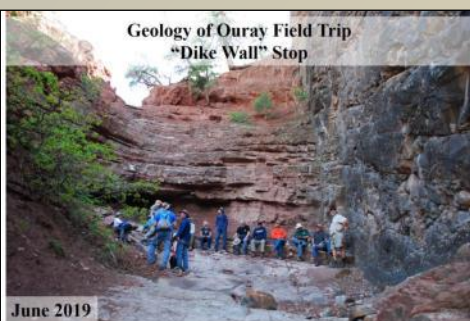
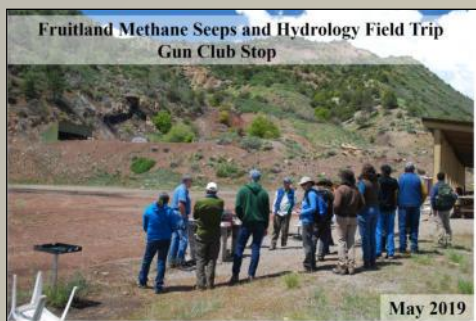
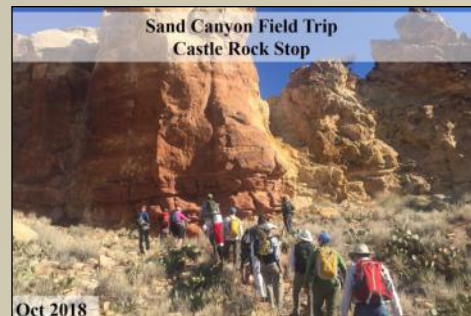
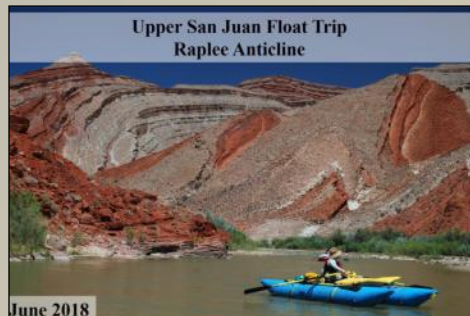


FIELD TRIP COMMITTEE NEWS

by Jim Corken, Field Trip Committee Chair



In just 2 short years, the Four Corners Geological Society has run 6 (count 'em, six!) field trips!! That's 3 per year! Each trip examined some of the outstanding geology we are blessed to be surrounded by and led by some of our local experts, who happen to be outstanding members of the Society.



In 2018, we studied the geology of the Durango area, floated the Upper San Juan and hiked Sand Canyon. In 2019, we examined methane seeps and learned about the geology and hydrology of Long Hollow Dam, studied the geology of the Ouray area, and finished the year hiking down from Molas Lake to the Animas gorge where we caught the train back to Durango. It doesn't get any better than that!!

Or does it??

Will next year's trips include something like:



or is there a trip that you've always wanted to do??

We are now gearing up to plan our trips for next year and are appealing to members to help propose and pick potential topics, subject matter experts, destinations, dates, etc. Our committee meetings are always productive, involving lively discussions on the technical merits and logistics of our ever-growing list of potential trips while consuming mass quantities of finger foods, desserts and beverages.

Please contact me (rjcork@aol.com) to join the fun!



2020 MEETING NEWS

by Kim Gerhardt,
General Co-Chair, FCGS

Although the RMS-AAPG meeting is still eleven months out the committee is working hard to build the program. Among the new developments:

WEBSITE

Our website is now live. Please check out <https://rmsaapg2020.com/>. Currently there is only a meeting announcement but links to new pages will open in the months ahead.

PUBLICITY

We are running a ¼ page ad in the AAPG Explorer in November and will repeat it in December.

VENUE / HOTELS WALK THROUGH

I traveled to Grand Junction in early November to tour the Two Rivers Convention Center and area hotels. Heidi Schoenstein (GJGS General Co-Chair) and I joined Michelle Gentzen & Ellen Husch (our meeting facilitators), Dave Abrahamson (Exhibits Chair), Larry Anna (Technical Program Chair), Bill Hood (Finance Chair) and Jesse Daniels (2RCC Events Manager) for a walk through of the convention facility. Together we mapped out spaces for the exhibit hall, poster sessions, three concurrent technical sessions, core display, breakfasts & luncheons, short courses and board meetings. Whew!

We toured three downtown hotels within walking distance of the convention center and several more on Horizon Drive, near the airport. We blocked rooms for the meeting in both locations. The committee felt that the downtown prices (about \$155/room) would be unacceptable to many attendees necessitating reserving more reasonably priced rooms in good quality hotels at a distance.

EXHIBITORS & VENDORS

Dave Abrahamson (Exhibits Chair) has finalized the booth layout in the exhibit hall and also has an outdoor area for displaying logging trucks. He has also worked hard on the website message for the exhibitor page, the downloadable reservation form and his email / snail mail letter to potential exhibitors. Our meeting facilitators (particularly Bruce Lemmon) will manage the contracts after Dave gets a commitment. We are planning to open that website page in early December and start the

campaign.

SPONSORS

Tom Ann Casey and John Youle (Sponsorship Co-Chairs) are similarly busy setting up their message to sponsors with targeted sponsorship opportunities. They have compiled a list of contacts from previous meetings and are almost ready to get started.

TECHNICAL PROGRAM & ABSTRACT SUBMISSION

We are planning on opening abstract submission in early January and closing it in April. We have reviewed several abstract management companies and will sign a contract with one in December. With the addition of several new chairs in the last two months and revision of some session titles, the technical sessions list is almost complete. Technical Program Co-Chairs Larry Anna, Elizabeth Petrie and Brad Burton will steward the abstract process and eventually design the schedule of talks for the meeting.

We still need a Short Course Chair. We have a growing list of suggested and committed courses but need someone with a firm hand to weed them out and schedule the remainder.

FIELD TRIPS

Co-Chairs Chip Head and Brann Johnson have winnowed our list of a dozen trips down to six. Three pre- and three post-meeting. This is probably still too many but we still have time to revise the plan. Field trip leaders are working their itineraries and logistics to get ready to post their offerings on our website this spring. With appropriate pricing (the hard part).

SOCIAL EVENTS

In addition to the Ice Breaker, mini-breakers and refreshments scheduled in the exhibit hall we have a guided geology bicycle tour on Sunday the 13th, a Monday evening event at the Dinosaur Journey Museum in Fruita with heavy hors d'oeuvres and local wine & beer, possibly a showing of the new Scott Tinker Movie "Switch On" on Tuesday night, and a vineyard tour on Wednesday afternoon. We are still working on the All Convention Luncheon and DPA speakers.

More news to come!
Stay tuned to this column!

Thanks, *Kim*



20/20 VISION

TURN HINDSIGHT / TO FORESIGHT

at the

**ROCKY MOUNTAIN SECTION
AAPG MEETING
SEPTEMBER 13-16TH, 2020
TWO RIVERS CONVENTION CENTER,
GRAND JUNCTION, CO.**



CO-HOSTED BY:
**THE GRAND JUNCTION GEOLOGICAL SOCIETY &
THE FOUR CORNERS GEOLOGICAL SOCIETY**

Mitch Bowers Photography, www.imagewerx.us

TECHNICAL SESSIONS

1. Powder River Basin Shale Play / Steve Sonnenberg.
2. The Mancos Shale / Western Niobrara Equivalent: Sedimentology, Geo-chemistry and Physical Properties / Steve Cumella and Robin Swank
3. The San Juan Basin: From Conventional Reservoirs to Resource Plays / Chip Head.
4. Clastic Reservoirs of the Rockies: Sequence Stratigraphy, Reservoir Quality and Producibility / Jeff Geslin.
5. Geochemistry and Basin Modeling of Pre-Cretaceous Rocky Mountain Petroleum Systems / Paul Lillis.
6. Pennsylvanian System of the Rockies / Gary Gianniny.
7. Lacustrine Basins, Sed/Strat & Petroleum Systems / Riley Brinkerhoff / Mike Vandenberg David Schmude / Nathan Rogers.
8. Non-Methane Gas Fields / Jeff Brame.
9. Energy Minerals of the Rockies – A Special Session in Honor of Bill Chenoweth / Mike Bingle-Davis and Edith Wilson.
10. Sustainable Development – New Technology to Address Field Liabilities / Need Chair
11. Structural and Tectonic Reinterpretations in the Rocky Mountain Region/ Elizabeth Petrie & Brad Burton.

12. History of Exploration and Production in the Grand Valley Area. Matt Silverman.
13. Application of Machine Learning, Artificial Intelligence & Metadata Mining to Petroleum Geology. Need Chair.

CORE POSTER SESSIONS

- Aneth Field: Stratigraphy, Facies and Petrology of a Carbonate Mound. New Observations Following the Acquisition of Resolute Core by UGS in 2017.
- Cane Creek Shale: New core being drilled in 2020 north of Moab in a joint project between UGS and the DOE.
- Mancos Shale Oil Window in the San Juan Basin. Extensive core from DJR Energy, not previously available to the public.
- Mancos Shale / Western Niobrara in the Piceance Basin. To be facilitated by SEPM.

SHORT COURSES

- Geo-programming using Python for Data Mining of State and Federal Databases. M. Bauer.
- DI Data Analytics
- Nuclear Magnetic Resonance (NMR) Wireline Logs. H. Daigle.
- Drones in Geoscience, Gregg Baker, CMU. ½ Day.

FIELD TRIPS

Pre-Meeting

1. Niobrara of the Northern San Juan Basin: Pagosa Springs, Piedra, Durango and Ridgeway, CO. Leader: Walter Nelson. (2 days)
2. Sedimentology, Structure and Salt Movement in Eastern Canyonlands. Leader: Brann Johnson. (2 days)
3. Piceance lles and Williams Fork near Grand Junction with Implications for Hydrocarbon Development. Leaders: Rex Cole, Mark Kirschbaum and Steve Cumella. (1 day)

Post-Meeting

1. Marginal Marine Reservoir Architecture and Stratigraphy of the Book Cliffs. Leaders: Keith Shanley and Mike Boyles. (4 days)
2. Green River formation in Piceance & Uinta Basins. Leaders: Michael VanDenBerg & Riley Brinkerhoff (2-3 days)
3. The Uncompahgre Uplift in Unaweep Canyon. Leader: Verner Johnson. (1 day)



**COME FOR THE
MEETING, STAY FOR
WINE FEST!**

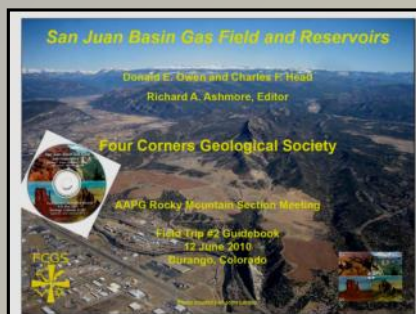
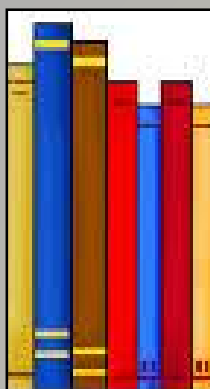
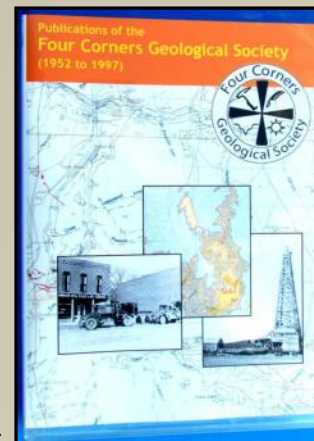


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FCGS PUBLICATIONS

Order online at: <https://fourcornersgeologicalsociety.org/bookstore/>

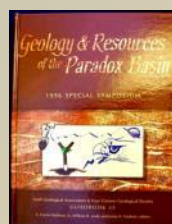
Publications of the Society: 1952-1997. This disk contains all publications of the Four Corners Geological Society (FCGS) from 1952-1997. Includes several which are out of print in hardcopy. Many contain classic papers on the geology of the Four Corners region. Much of the emphasis, but not all, is on exploration for oil and gas. Twenty publications in all. **UPDATED** - now includes Owen & Head, 2010, San Juan Basin Gas Fields and reservoirs. **\$105.**



San Juan Basin Gas Fields and Reservoirs: A Field Guide on CD. 2010, D.E. Owen and C.F. Head. A (CD) field guide of a 200 mile traverse from Durango and back into the heart of the San Juan Basin. Discussion covers Cretaceous and Tertiary reservoir outcrops, landforms, stratigraphy, history of exploration and development, and the hydrocarbon system of the basin. **\$25.**



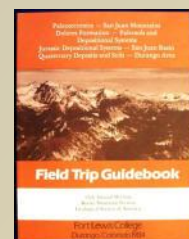
Natural Fracture Systems in the Southern Rockies. 1997. Sixteen full-length papers and 12 abstracts covering a variety of topics on natural fracture systems. Soft-spiral bound. 210p. **\$45**



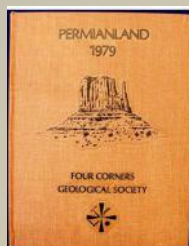
Geology & Resources of the Paradox Basin. Special Symposium with Utah Geological Association. 1996. A.C. Huffman, ed. Thirty-three technical papers and road log. Hardbound. 460p. **\$65.**



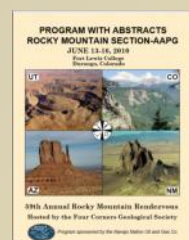
Four-Corners Oil & Gas Fields, Vols I, II, and III. Oil & gas field papers include geologic setting, discovery well drilling and completion practices, and reservoir data for each field. Vol. I&II (1978) includes 242 field papers, 726p. Vol. III (1983) has 95 field papers, 415p. Looseleaf ring binders. **\$60.**



Field Guide - Durango Vicinity. 1984, 37th Annual Meeting of Rocky Mountain Section GSA. Includes excellent road guide. Softbound. 209p. **\$22.**



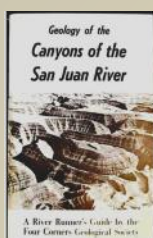
Permianland. 1979. Ninth field conference. Hardbound. 186p. **\$22**



Program with Abstracts: RMS-AAPG 2010. Programs with Abstracts Volume and CD from the 2010 Rocky Mountain Section AAPG 59th Annual Rocky Mountain Rendezvous in Durango, CO, June 13-16th 2010. **\$5.**



FOR RIVER RUNNERS!!



Geology of the Canyons of the San Juan River. 1974. The classic geologic river guide to the San Juan River from Bluff, Utah to Clay Hills Crossing. Softbound, water-resistant. 94p. **\$15.**



Cataract Canyon and Vicinity, 1987, John A. Campbell, Editor. FCGS Tenth Field Conference. Twenty eight papers, Hardbound, 199p. **\$25.**



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FOUR CORNERS GEOLOGICAL SOCIETY

P.O. Box 1501, Durango, CO 81302

MEMBERSHIP RENEWAL or APPLICATION: June 1, 2019 to May 31, 2020



*Name: _____

*Address: _____ City: _____ State: _____ Zip: _____

*Email: _____ Phone: _____

*Employer: _____

Please Identify a Membership Category:

Active Member	\$25	Any person engaged in the practice or teaching of geology or who holds a Bachelor's Degree in geological science from a college of acceptable academic standards. Degree requirement may be waived if applicant has adequate professional experience. <i>*Highest Degree, Type and Year:</i> _____ <i>*College / University:</i> _____
Associate Member	\$25	Any person who is a graduate of a college of acceptable academic standards with major studies related to, or associated with, geology. Degree requirement may be waived if applicant has adequate professional experience. <i>*Highest Degree, Type and Year:</i> _____ <i>*College / University:</i> _____
Student Member	Free	Any undergraduate or graduate student majoring in geology at a college of acceptable academic standards. <i>*College / University:</i> _____ <i>*Year expected to graduate:</i> _____
Emeritus Member	Free	An Active Member of 65 years old or older who has been a member for 25 years including time spent in military service. <i>*Year emeritus status was awarded:</i> _____
Honorary Member	Free	An Active Member who has contributed distinguished service to the profession of geology and to the betterment of the FCGS. Determination is made by the FCGS Executive Committee. <i>*Year honorarium was awarded:</i> _____.

Other Professional Interests:

** Required information for new members. Current Members, please update.*

*Please check your interests:

- ☐ Sedimentology & stratigraphy
- ☐ Structure & tectonics
- ☐ Mineralogy, petrology, geochemistry
- ☐ Igneous geology, volcanology
- ☐ Ore geology and hard rock mining
- ☐ Other mineral extraction
- ☐ Petroleum geology
- ☐ Geophysics
- ☐ Geological engineering
- ☐ Geomorphology
- ☐ Quaternary geology
- ☐ Hydrology & water resources
- ☐ Environmental geology
- ☐ Geography / GIS
- ☐ Other interest (see box)

Please either print, complete and return this form with your check for dues made payable to: "Four Corners Geological Society" and mail to the address above or go online to fourcornersgeologicalsociety.org .