



# DECEMBER 2019 NEWSLETTER FOUR CORNERS GEOLOGICAL SOCIETY

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## DECEMBER DINNER MEETING

**SPEAKER:** Dr. Melissa Clutter, Fort Lewis College

**TITLE:** Simple and Robust Measurement

**Networks: Where Should I Install  
Sensors in the Field?**

**DATE:** Thursday, December 12th

**LOCATION:** Fort Lewis College: Sitter Family Hall, Room 710

**TIME:** 5 to 6 pm: Student Posters on 1st floor hallway of SFH  
5:30-6:30 pm: Happy Hour at the Wall of Time, moving to  
Room 710 ~6 pm, 6 pm Dinner Served in SFH 710  
7 to 8 pm: Talk (followed by the raffle)

**COST:** \$20pp with RSVP by deadline, \$25 post deadline and while  
food lasts, \$2pp talk only.

**STUDENTS:** The first 10 students to contact Dr. David Gonzales  
([Gonzales\\_d@fortlewis.edu](mailto:Gonzales_d@fortlewis.edu)) can attend for free.

**RSVP:** By Tuesday, December 10th at 5pm to Sabina Kraushaar  
([smkraushaar@gmail.com](mailto:smkraushaar@gmail.com)) or online:  
<https://fourcornersgeologicalsociety.org/>



MANY THANKS TO SGM FOR SPONSORING  
6 STUDENT DINNERS THIS MONTH!



**Save the Date!**

December 6th - Christmas Bash with the Petroleum Club, Landmen and SPE

January 16<sup>th</sup> @ TBD

February 20<sup>th</sup> @ TBD

March 12<sup>th</sup> @ TBD

April 16<sup>th</sup> @ FLC: Graduating Seniors present Senior Theses.

April 30<sup>th</sup> @ TBD

**ABSTRACT:** There is an archetypal problem of scientists creating information that is not needed by society and decision-makers not getting the scientific information they need to make the most informed decisions. The nature of my hydrologic research is based on principles of connecting science and decision-making and closing the “gap” in knowledge-based action system. My research focuses on optimizing measurement networks prior to sensor installation using statistical modeling approaches. My projects are intended to aid in decision-making within the local and regional community. By localizing my projects, I hope to create more community-based relevance for my scientific findings. What's your network design question?

**BIOGRAPHY: Melissa Clutter, Fort Lewis College**

Melissa Clutter is an assistant professor in the Geosciences Department at Fort Lewis College. Born and raised in Tulsa, Oklahoma as part of Cherokee Nation, she traveled West in 2007 to attend Fort Lewis College. What she didn't know was that she would soon fall in love with Durango and the Four Corners region. She is a proud alumna of the FLC Geosciences Department. After college, she worked at Chesapeake Energy Corporation in Oklahoma City for three years as an Engineering Technician. Determined to change career paths and seek higher education, she went to the University of Arizona for graduate school as a National Science Foundation and Alfred P. Sloan Foundation fellow. Graduate school helped her pursue her dreams of not only earning a doctorate (and doing awesome field research in Japan), but also by helping her land a job back at Fort Lewis College. She is thrilled to be here!



# “PREZ SEZ” by Sabina Kraushaar

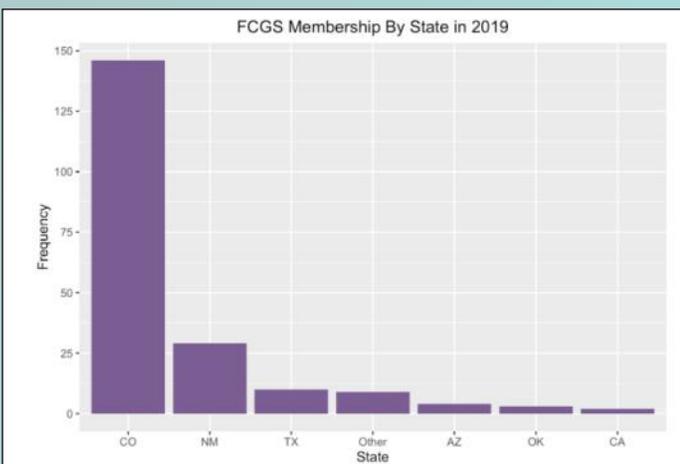


Lately I’ve been very excited about data science and all the things we can do to look at old data with “new eyes” and more advanced technology. Paul Spear gave an excellent talk about the helium potential in the Four Corners area, and one of his arguments was that looking through old data with new techniques can be very powerful.

On that note, I am going to share a little Four Corners Geological Society membership basic data analysis with you! I’ve put together a couple of plots using R software that show where the current FCGS members live, and what year they joined the FCGS. Going through the

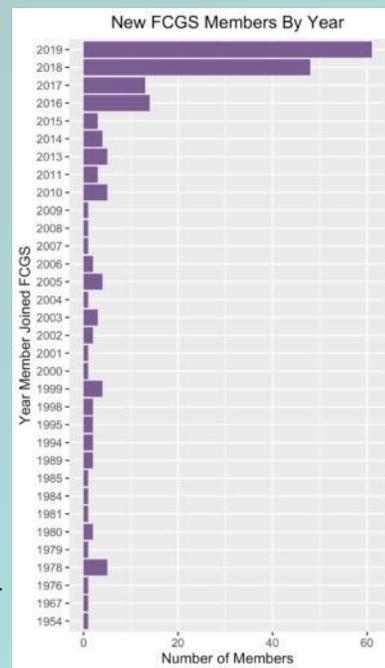
Top 10 Cities of FCGS Members	
City	# of FCGS Members
Durango, CO	99
Farmington, NM	13
Hesperus, CO	5
Aztec, NM	4
Denver, CO	3
Golden, CO	3
Lakewood, CO	3
Ignacio, CO	3
Pagosa Springs, CO	3
Houston, TX	3

membership data meticulously collected and organized by Tom Ann Casey and Jolin Cordalis has helped guide our decisions when it comes to where we hold monthly meetings and what topics we cover.



As of November 2019, there are 205 current FCGS members, with 48% living in Durango, CO and 6% residing in Farmington, NM. Most of our members live in Colorado, New Mexico and Texas.

The plot on the right shows the number of new members who joined by year. Our most long-term member has been with the FCGS since 1954, over 50



years! We are so thankful to have members who have been involved with our society for so long. Hopefully we will retain many of the new members who have joined in the past ten years.

This December we will be hosting newly hired FLC professor Dr. Melissa Clutter at Fort Lewis College for a talk about groundwater hydrology. Posters from graduating seniors will one display during the social hour. Should be a great event! Hope to see you there.

Happy holiday season,

Sabina

## WELCOME NEW MEMBERS! (since September)

David Cole: Bow Mar, CO

Tim Davis: Houston, TX

Ken Hilfiker: Durango, CO

Deric Hook: Durango, CO

J. Scott House: Gallup, NM

Stuart Hyde: Durango, CO

Peter Mesard: Walnut CK, CA

Scott Petsel: Henderson, NV

Jeff Schell: Durango, CO

Kathy Tureck: Durango, CO

Ian Tyler: Riverton, WY

Amanca Webb: Durango, CO

And 20 New Student Members - Thanks to all of you!



# NOVEMBER MEETING

with Paul Spear and the  
Farmington Crew



thanks Tim Rynot for the  
fun photos!



THE DURANGO PETROLEUM CLUB,  
FOUR CORNERS GEOLOGICAL SOCIETY  
SAN JUAN BASIN LANDMAN'S ASSOCIATION  
AND 4CORNERS SOCIETY OF PETROLEUM  
ENGINEERS  
PRESENT:  
**2ND ANNUAL OILFIELD  
TRASH CHRISTMAS BASH!**

Please join us on  
December 6<sup>th</sup>, 2019  
at the Irish Embassy  
(Downstairs)  
5:00 to 9:00pm

Durango Petroleum Club, FCGS and Four Corners  
Society of Petroleum Engineers, and San Juan Basin  
Landman's Society Members are Free!  
Guests \$25  
Please RSVP @ 970.903.5808 by  
12/4/19

Thank you to our Sponsors



**PARTY!!!**



**Sponsored**



**by:**



## Farewell to our friend and mentor, Ed Heath



It is with great sadness that we say farewell and pay our respects to our good friend and long-time member, Ed Heath. The contribution that Ed made to our profession and to our Society is immense. We will always remember him and he will be greatly missed.

### Edward Wyman Heath

Edward "Ed" Heath, passed away in his Durango, CO. home on November 13, 2019. He was born in Dallas, Texas on August 4, 1931 to Francis Edward Heath and Madeline Squire Heath.

Ed was a man of integrity, honesty, kindness, helpfulness and generosity. We will miss his booming voice, his "Big Ed" chuckle and gentle soul.

Ed attended two years of undergrad at Sewanee University where he also played for the football team. He then transferred to Colorado School of Mines where he received his Bachelor of Science in Geology. After marrying his wife, Elizabeth "Libby" Culbertson in 1955, he served in Korea as platoon leader in the Army Corp of Engineers. After an honorable discharge, he, his wife and newborn son moved to Massachusetts where he earned a master's degree in Geology and Geophysics from MIT.

Ed and Libby logged many miles driving across the country (one of his many loves) to visit their four children and friends. He was fondly referred to as "the Road Warrior", loved his maps and loved preparing for road trips.



Ed was a successful exploration geologist spending most of his career in Texas. After retiring from full-time work, he and Libby moved to Durango, CO. in 1999 where he continued doing consulting work for the Southwest region of the U.S. He was very involved with several geological societies, including the AAPG and Four Corners Geological Society. He spent countless volunteer hours with these organizations many other interests.

In memory of Ed, donations may be made to Annie's Orphans ([anniesk9orphans.org](http://anniesk9orphans.org)) or to St. Mark's Episcopal Church.



***Happy Holidays to All and Many Blessings for the Coming Year***

***Remember - 2020 is AAPG-RMS in GJT!***

## FIELD TRIP COMMITTEE NEWS

In just 2 short years, the Four Corners Geological Society has run 6 (count 'em, six!) field trips!! 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 Jim Corken ([rjcork@aol.com](mailto: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 13<sup>th</sup>, a Monday evening event at the Dinosaur Journey Museum in Fruita with heavy hors d'ouvres 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 13-16<sup>TH</sup>, 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](http://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 Iles 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!**



# 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:

<b>Active Member</b>	\$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. *Highest Degree, Type and Year: _____ *College / University: _____
<b>Associate Member</b>	\$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. *Highest Degree, Type and Year: _____ *College / University: _____
<b>Student Member</b>	Free	Any undergraduate or graduate student majoring in geology at a college of acceptable academic standards. *College / University: _____ *Year expected to graduate: _____
<b>Emeritus Member</b>	Free	An Active Member of 65 years old or older who has been a member for 25 years including time spent in military service. *Year emeritus status was awarded: _____
<b>Honorary Member</b>	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. *Year honorarium was awarded: _____.

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](http://fourcornersgeologicalsociety.org) .**