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OCTOBER 2021 NEWSLETTER



FOUR CORNERS GEOLOGICAL SOCIETY

SEPTEMBER MEETING

SPEAKER: Dr. Jeff Geslin, Adjunct Professor @ Fort Lewis College
and Pictured Cliffs Geoscience, LLC

TITLE: *An Eocene "Source-to-Sink" Example in Piggyback
Basins, Pyrenean Fold and Thrust Belt, Spain*

DATE: Thursday, October 21st

TIME & LOCATION 5:30 pm Social, Drinks and Lots of Great Apps!
Appetizers/Happy Hour will be at the Wall of Time
Atrium in the Sitter Family Hall Bldg, Fort Lewis College
6:30 pm - 7:30 pm. Move to Room 710 for Speaker,
followed by raffle
ZOOM meeting will start at 6:30 pm.

ZOOM LINK: [Click Here for Zoom Meeting Link or
https://fortlewis.zoom.us/j/92488867564](https://fortlewis.zoom.us/j/92488867564)

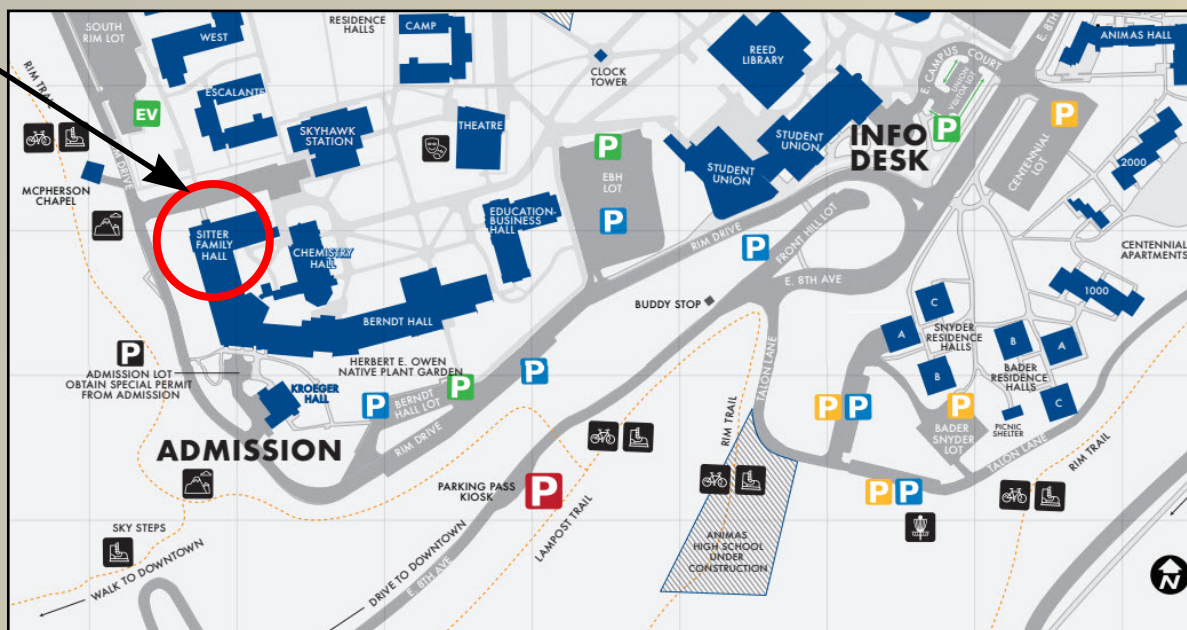
COVID: Meeting is at FLC: Per Fort Lewis Policy, **VACCINATION IS
REQUIRED TO ATTEND IN PERSON.** If you are not
vaccinated, please use the Zoom option.

COST: \$20/person. Please RSVP by Tuesday, October 19th at
noon if possible. PLEASE go to the website to pay and
register: <https://fourcornersgeologicalsociety.org/event>
Or you can email Jon Harvey at jeharvey@fortlewis.edu
The first 10 Students to sign up with Dr. Geslin will be
sponsored by Jeff and the FCGS.
The cost helps support the students.



Four Corners Geological Society, P.O. Box 1501, Durango, CO 81302
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Map of Meeting Location



***Our Speaker:* Jeffrey Geslin, Ph.D.**

Geologist and Geophysicist

Jeffrey Geslin is a consultant and educator living in Durango, Colorado. He received his Ph.D. in geology from the University of California Los Angeles in 1993 after completing geoscience degrees from the University of Northern Colorado (BA) and Idaho State University (MS). Jeff held post-doctoral research positions with the USGS and Idaho State University before joining ExxonMobil in 1998. At ExxonMobil, Jeff held positions across the upstream, from research to exploration and production. He worked on projects in numerous locations globally, including southeast Asia, west Africa, eastern Canada, and eastern Russia. Jeff held several technical and managerial positions at ExxonMobil, and most recently was the corporation's Senior Technical Consultant in Stratigraphy. He retired from ExxonMobil in late 2018. He is now the owner of Pictured Cliffs Geoscience LLC, and an Adjunct Professor of Geology at Fort Lewis College.



Jeff's technical interests include: 1) Petroleum geology, specifically reservoir performance evaluation, stratigraphic controls on play elements, acreage and prospect evaluation, integrated conventional production activities, and stratigraphic controls on unconventional reservoir performance; 2) Sequence stratigraphic evaluation of clastic strata, including fluvial, shallow-marine and deep-marine environments; 3) Applied geophysics (seismic interpretation and seismic sequence stratigraphy); and 4) Teaching, advising and mentoring geoscientists. Jeff has published over 60 articles, abstracts and technical reports.

A Big Thank You to Jeff for sponsoring 5 students this month



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Abstract

An Eocene "Source-to-Sink" Example in Piggyback Basins, Pyrenean Fold and Thrust Belt, Spain

Jeffrey Geslin and Timothy Demko

- * Contributions from: Vitor Abreu, Brian Darby, Chengli Lu, Rene Jonk, Keith Knabe, Pamela Reynolds
- * ExxonMobil Exploration Company and ExxonMobil Upstream Research Company

A well-exposed example of a source-to-sink depositional system was evaluated using Middle Eocene (Lutetian) strata contained in piggyback basins of the Pyrenean Fold and Thrust Belt (PFTB). The purpose of this study was to: 1) refine sequence stratigraphic models linking continental, shelf and deepwater settings; 2) understand external controls on sediment flux; 3) evaluate the effect of multiple sediment entry points in a basin; and 4) construct a model for the interactions of depositional systems and growing compressional structures.

The Lutetian PFTB comprised a series of small, linked basins that were connected to the Atlantic Ocean to the west. These basins formed in a piggyback setting during south-directed thrusting. East-west transitions between basins are defined by lateral ramps associated with thrusts. Deposition in these basins recorded the interaction of tectonics and sedimentation from fluvial/shelf EODs (Trempe Basin) to slope (Ainsa Basin) and basin (Jaca Basin). Sediment transport was both axial and transverse with respect to the major structural fabric of the PFTB. Correlation of Lutetian strata throughout the depositional system was accomplished with extensive biostratigraphic analyses, as well as outcrop interpretation and mapping. Integration of published PFTB structural reconstructions allows a better understanding of the response of depositional systems to growing compressional structures.

In the early Lutetian, the lateral ramp of the Montsec thrust in the core of the Mediano anticline, formed a structurally-controlled shelf/slope transition between the Trempe and Ainsa basins. Strata of the Montañana Group (Trempe basin) include fluvial-shallow marine sediments transported to the WNW, as well as coarse-grained fan deposits shed to the south off of the Pyrenean axial zone. The Montañana Group is coeval to 4 deepwater composite sequences in the Ainsa Basin that form a Lowstand Composite Sequence Set, capped by a Composite Maximum Flooding Surface. This mid-Lutetian MFS approximates a time of basin reorganization; the overlying Highstand deposits of the Sobrarbe deltaic complex were transported to the NNW, around and parallel to the Mediano anticline. Further west, the Boltaña Anticline marks the boundary between the Ainsa slope channel systems and the Jaca basin-floor fans.



Eocene Deltaic deposits of the Roda Sandstone near the village of Roda De Isabena



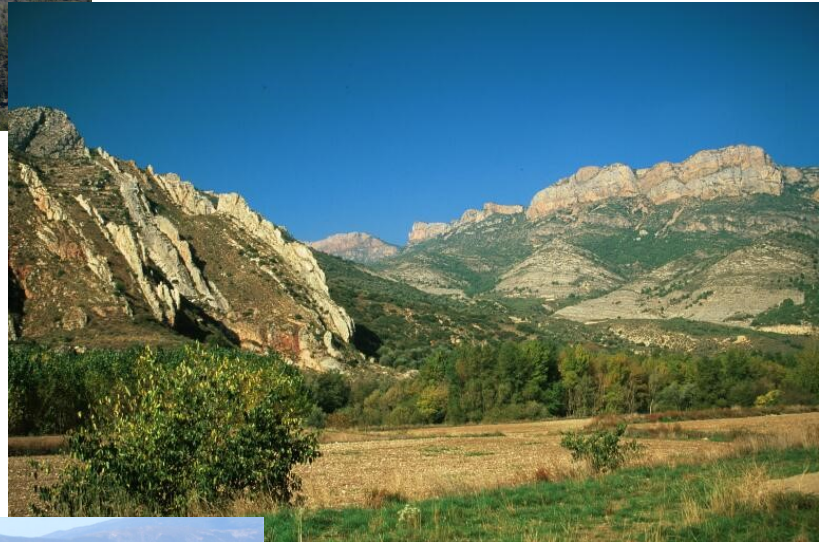
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Eocene deep-water strata (foreground), Boltaña anticline (midground), and core of the Pyrenean fold and thrust belt (background)

Photos courtesy of
Jeff Geslin

Exposure of the Sierras Marginales thrust near the village of Camarasa"



A condensed section of shallow marine sandstones on top of the Mediano anticline, adjacent to the village of Pano

SAVE THE DATES!

Nov. 18: Dr. Joel Pederson (Utah State University): Landscape evolution in the Book Cliffs of Utah

Dec. 9: Dr. Ron Hill (EOG Chief Geoscientist): Unconventional petroleum systems in the Western US



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"PREZ SEZ" by David Schiowitz

Salutations FCGS members,

What a joy it was to host our first in-person meeting of the fall season atop of the Sitter Family Hall deck. It was great interacting with members and students. I would like to extend a big thank you to Dr. Tewksbury-Christle for her intriguing talk on low seismic velocity zones in the Condrey Mountain Schist subduction complex in northern California.

For the meeting on Thursday, October 21st, Dr. Jeff Geslin (current Prez-elect) will be discussing a source-to-sink depositional system within the Pyrenean Fold and Thrust Belt of Spain. See page 1 for additional details and COVID requirements. For those who can't attend in-person we will have a Zoom option starting around 6:30 pm.

I am excited to announce our first "Talks on the Rocks" that Dr. Gary Gianniny will be leading on Saturday, October 16th. The field trip will be looking at the depositional facies and bedforms of the Jurassic Entrada and Junction Creek (Bluff) Sandstones (eolian sandstones) of Durango. This field trip will be limited to 15 members (vaccination required).

I recently had the opportunity to join the new Fort Lewis on the Water (FLOW) rafting program at FLC with a 3-day raft trip down the San Juan River from Sand Island to Mexican Hat, Utah. FLOW is the culmination and hard work of multiple departments and staff at FLC that started with the purchase of a commercial rafting company that was finalized in 2020. FLOW provides river-based programming and educational opportunities for a range of academic departments, co-curricular programs, FLC alumni, and community partners.

I and another alumni joined this year's geomorphology and sedimentary and stratigraphy classes as they conducted field labs along the river. I was amazed by the excitement and thought-provoking discussions among the students, staff, and guides. Whether Dr. Harvey discussed dating sediments in river terraces, abandoned river channels, and evidence of past floods, or when Dr. Gianniny had the students apply the Dunham classification to describe the limestones in the Honaker Trail Formation, the students were engaged and experiencing what they learned in the classroom. FLOW is truly a unique opportunity for FLC students and staff and I am thankful to have been part of the trip. On that note, the society is looking into organizing a river trip with FLOW in the future (late spring or summer of 2022?) so keep a look-out for more information. And check out the photos from our trip.

All the Best,

David



Zoom Link is: (click)

<https://fortlewis.zoom.us/j/92488867564>

SOCIETY NEWS

SAVE THE DATES!

Nov. 18: Dr. Joel Pederson (Utah State University): Landscape evolution in the Book Cliffs of Utah

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"TALKS ON THE ROCKS" (1/2 - 1 day fieldtrip)

The Four Corners Geological Society is pleased to announce our first "Talks on the Rocks" Field Trip. This will be a half-day informal field trip to a local Durango site where participants will observe and discuss local strata.

What: Half-day field looking at the depositional facies and bedforms of the Jurassic Entrada and Junction Creek (Bluff) Sandstones (eolian sandstones) of Durango.

Who: Dr. Gary Gianniny

When: Saturday, October 16th from 8:30 am to 12:00 pm.

Where: East Animas Climbing area on CR 250

Hike Difficulty: Short hike with moderate elevation gain (less than 500 ft) on a steep rocky trail.

Registration: Limited to 15 society members. Registration opened at 8:00 am on October 9th. Register here ([Click Link](#)) to reserve your spot.

Logistics: Participants will be emailed additional information, meeting location, directions, and waiver.



SOLD OUT

2 spots have opened up as we go to press! Contact Jon Harvey directly @ jeharvey@fortlewis.edu if you are interested



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NEWS FROM THE FOUNDATION

The FCG Foundation explores new ways to support geoscience education & research.

The Foundation is pleased to announce that Gordon Greve has been approved as a new director.

Thank you, Gordon, for volunteering for this important position.

Donations are gratefully accepted to support the scholarship program. You can send a check to "Four Corners Geological Foundation" at FCGS / P.O. Box 1501 / Durango / CO 81302.

THANK YOU VERY MUCH FOR YOUR SUPPORT!

Patti Phillips

Four Corners Geological Foundation Secretary



BS and MS Geology: Louisiana State University
Moved: 2 years ago to Durango, CO after 27 years in Anchorage, AK
Retired: petroleum geologist/petroleum engineer: 10 years Marathon Oil, Texas and 18 years BP, Alaska
Married: to Ken Hilfiker for 35 years
Children: one son living in Denver, CO; another son married and living in Stowe, VT with our grandson!
Hobbies: hiking, backpacking, mountain biking, fat (snow) biking, light touring and skate skiing, snowshoeing, birding and traveling!!
I'm always looking for folks to join me on an adventure!



**FEATURED THIS
MONTH!**

Jim Fassett

Four Corners Geological Foundation Director



Jim received BSc and MSc degrees in geology from Wayne State University in 1959 and 1964. He has over 60 years' experience in the energy resources of the Rocky Mountain area, the Warrior Basin of Alabama, and southern Pakistan. In Pakistan, he was the Team Leader of the USGS team that helped improve and modernize the Pakistan Geological Survey and in 1992-93 discovered and delineated the giant (80-billion metric tons of coal) Thar Desert Coal Field of SE Pakistan. Jim has published 150 papers on energy resources in these areas.

Additionally, he has conducted an intensive study of the Cretaceous-Tertiary (K-Pg) boundary in the San Juan Basin. In 1988 he was awarded a U.S.G.S. Gilbert Fellowship to pursue those studies. Jim has published many papers on the Paleocene dinosaurs of the San Juan Basin including a detailed monograph published in the online journal *Palaeontologia Electronica* in 2009. In 2011, Jim and coauthors published a paper in *Geology* in which they directly dated at 64.8 Ma Paleocene dinosaur bone, using laser-ablation, U-Pb methodology: The first-ever successful radiometric dating of a vertebrate bone anywhere in the world.

Jim retired from the USGS in 2000, moving with his wife Sarah to Santa Fe, New Mexico. He continues his research and speaking at professional society meetings. Jim is a Past President and Honorary Life Member of the FCGS, and Past President and Honorary Life Member of the New Mexico Geological Society. He has edited multiple guidebooks on the geology of the Four Corners Area for the FCGS, NMGS, and RMAG. His research on the Lazarus dinosaurs of the SJB is ongoing with colleagues at the U. of Alberta, Notre Dame U., and New Mexico Tech.



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FLC on the Water! FLOW



NEWS FROM AROUND THE REGION

Retention in Geoscience Survey by Women Geoscientists in Canada

For a long time, there's been talk about leaky pipelines, the need for diversity, and thinking about the future of geoscience. However, finding data has been tricky. WGC has created a survey to gain insight on retention in the geosciences. Although this survey has been put forth by the Women Geoscientists in Canada, it is intended to explore the factors involved in retention, regardless of gender and location, so please share widely with your friends and colleagues, especially if you know people that have left the geoscience profession.

The survey is open until October 31.

Give your opinion at <https://shoutout.wix.com/so/7fNmA7ft6?languageTag=en&cid=82b96d7c-dd5a-4c41-95fc-00f5a91d4f93#/main>

Mining-4-Beer

Tuesday, October 19; between 5 and 7:30 pm

Propeller (propelleraero.com) is hosting our next Mining 4 Beer! We hope that you will join us Tuesday, October 19 at their office in the RINO district near downtown Denver. Propeller will be providing beer and appetizers. Their office is located at 3360 Walnut Street, Denver 80205.

Thank you to Amanda Smith and her team at Propeller for graciously hosting our group! See you there!

Kelly Ward

kelly.ward@marsh.com; 720-364-1244

STATUS OF CONVENTIONAL AND UNCONVENTIONAL EOR/IOR PROCESSES IN THE POST-COVID/ENERGY TRANSITION ERA

KU TORP IOR WORKSHOP by KU Tertiary Oil Recovery Program & PTTC

Tue, Nov 2, 2021, 8:00 AM – Wed, Nov 3, 2021, 5:00 PM MDT

This 2-day Online IOR Event will be held on zoom over both days. Credentials will be sent within 24-hours of registration.

Instructional hours provided: 14

Day 1: Conventional IOR- What works and what is affordable?

Day 2: Unconventional IOR- What works and what is affordable?

Early registration ends October 16.

To register or get more info, go to https://www.eventbrite.com/e/ku-torp-ior-workshop-tickets-166969505285?aff=odeimcmailchimp&mc_cid=ea77bfb685&mc_eid=c8827b406b



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NEWS FROM AROUND THE REGION

The Geology of Wine and Cheese: How Caves Influence Wine and Cheese

Friday 12 November 2021; 4:00 PM Central Time; Free Access Zoom Platform Format

Co-Hosted by: AAPG Women's Network, Midwest GeoSciences Group, Association of Women Geoscientists, Haak Vineyards and Winery, and Murray's Cheese

Discover the important role that geology plays in wine and cheese through an educational pairing event! Have you ever wondered which unique geological factors - such as cave formation, temperature and humidity - influence your cheese's flavor and the aging processes?

Is there a "terroir" of cave-aged cheeses? Expert panelists will give you the scoop and answer your questions, and also discuss the history, culture, and even anthropology of the cave-cheese-wine trifecta. After an engaging educational tasting event, grow your geoscience+cheese+wine lovers community through interactive networking. We look forward to growing our passion with you all!

To register or get more info, go to https://midwestgeo.com/webinars/geologyofwine-11122021.php?utm_source=mailchimp&utm_medium=email&utm_campaign=10062021wine

Grand Junction Geological Society

GIGS.org

Oct. 20 - Dr. Tomas Villamil, Omega Energy

Entrepreneurship in the Petroleum Industry: Examples from Columbia, South America

Nov. 17 - Dr. J.G.M. "Hans" Thewissen, Northeastern Ohio College of Medicine

The Origin of Whales and "Missing Link" Fossils from Pakistan and India

Dec. 15 - Dr. Verner Johnson & CMU students, Colorado Mesa Univ.

The Origins of Magnetic Anomalies in the Colorado National Monument area



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FOUR CORNERS GEOLOGICAL SOCIETY

P.O. Box 1501, Durango, CO 81302

MEMBERSHIP RENEWAL or APPLICATION: June 1, 2021 to May 31, 2022



*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. *Highest Degree, Type and Year: _____ *College / University: _____
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. *Highest Degree, Type and Year: _____ *College / University: _____
Student Member	Free	Any undergraduate or graduate student majoring in geology at a college of acceptable academic standards. *College / University: _____ *Year expected to graduate: _____
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. *Year emeritus status was awarded: _____
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. *Year honorarium was awarded: _____

Other Professional Interests:

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

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.

Please donate to the Foundation to support student research. Make out your check to: "Four Corners Geological Foundation" and include it in the envelope with your dues.

*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)