Moab is Sinking from a Wave of Incision—Rates and Patterns of Salt Tectonics and Landscape Evolution in Utah’s Canyonlands

Joel Pederson, Utah State University

Previous work in the central Colorado Plateau has identified patterns of river incision and topography that suggest a wave of very rapid incision passing through the region. Superimposed on this is local salt deformation that has been unquantified. Parsing out the patterns and rates of regional incision and active salt deformation are a rich challenge. We have been using mapped stream terraces and basin-fill deposits dated by luminescence and cosmogenic-isochron-burial dating to quantify Quaternary incision, active faulting, and salt deformation along the Colorado River and its tributaries around the areas of Cataract Canyon, Moab, Spanish Valley, and Professor Valley.

In this presentation, I will focus on new results from Jackson Rincon just downstream from Moab, and from Spanish Valley and Moab City itself. Results identify a wave of incision passing through the system over middle-late Pleistocene time, while being linked to rapid faulting and subsidence in Moab City. It should be no surprise that youthful, transient incision is a hallmark of Utah’s canyonlands, which has, in turn, set off
active salt deformation. Yet, the source for such recent baselevel fall in the central Colorado Plateau remains a mystery.

Biography: Joel L. Pederson, is Professor and Department Head of Geology, Utah State University. Joel received an M.S. in Geology from Northern Arizona University (1995) and a Ph.D. in Geomorphology from the University of New Mexico (1999)

Joel is a geomorphologist whose research interests include the landscape evolution of the Interior Western U.S., applications of OSL geochronology, and geoarchaeology, with topics ranging from the uplift and erosion of the Colorado Plateau to OSL dating of rock art.

Joel grew up as a farm boy in Minnesota and made the pilgrimage west to study geology. He served as the Undergraduate Director and then Graduate Director for the Department of Geology before his current role as Department Head. Joel founded the USU Luminescence Laboratory in 2006, which is one of the few facilities in the western U.S. for this type of numerical dating.

***** LUNCHEON LOCATION *****

The May UGA luncheon meeting will be at 12:00 noon, Monday, June 11th, 2018, at the Utah Department of Natural Resources, 1594 West North Temple. Enter on south side.

Please make your reservations no later than 4:00 p.m. on Thursday June 7th. Click to make reservations for the Luncheon Meeting by sending email to reservations@utahgeology.org.

PLEASE NOTE: If after making a reservation you know you will be unable to attend, please notify the Treasurer no later than 9:30 a.m. on the day of the talk so that a walk-in may take your place. Otherwise, no-shows will be billed $10.
**President’s Message**

The APG meeting was a huge success! All of the UGA-sponsored trips went well: participants praised all of the trips, including the Great Salt Lake trip which had a bus break down near Golden Spike. Congratulations to member and field trip leader Tom Chidsey for being awarded the 2018 AAPG Public Service award! He did an excellent job on his field trip, receiving praise for leading an excellent field trip to the Moab/Arches area. I think field trip attendee Dr. Roy Shlemon summed it up nicely when saying:

“The accommodations were terrific, the field logistics excellent, and the views and technical information truly amazing and much appreciated.”

Our President Elect, Peter Nielsen, has issued a call for papers for his very exciting UGA guidebook concept “Geosights of Utah.” The guidebook will inform the public of the in-depth geology of major points of interest throughout Utah. UGA is coordinating with the UGS to potentially release the guidebook as a web map to facilitate touring of our amazing state!

The UGA T-shirts and polos are now available to members at a cost of $15 for T-shirts and $25 for polos. I have created an online survey (https://goo.gl/forms/xCWwUM9LB61rpEJx2) to get an idea of how much additional inventory we might need, as the shirts sold well at the AAPG meeting. I will keep the shirts in my office at the DNR, and they will be available at the meetings. The company that orders the shirts is local and provides a turn-around time of a couple of weeks. Thanks to Adam McKean for doing an excellent job ordering the shirts.

Paul Inkenbrandt

UGA President, 2018
Call for Papers
Utah Geological Association
2019
Publication 47

The Utah Geological Association (UGA) invites you to contribute one or more short papers for its 2019 publication Utah GeoSights. This publication will be made available as a PDF and interactive web-based map. A print version may also be produced.

What is a GeoSight? — Any place where a unique, interesting, or fascinating geologic feature can be viewed. The intent of this publication is to highlight many such sites, not only those featured in national parks and monuments but also lesser-known geologic wonders. Sites need to be evident to an average geologist or technical lay-person, viewable in a single viewed, and accessible by high-clearance vehicle and/or a short hike.

Articles should be 2-8 pages, and include a GPS location, stratigraphic column, geologic map, references, and multiple photographs with detailed descriptions. The text should not be too technical, rather something a savvy lay person or high school earth science teacher can understand. We want this publication to be used by geologists, science teachers, field-trip guides, or any person or group traveling in our geologically enriched state.

Interested authors should submit a title and brief description (a couple of sentences is sufficient) for each proposed GeoSight by June 30, 2018. Completed, peer-reviewed drafts will be due by January 31, 2019.

Please send the title, brief description, and contact information via email to UGA 2019 Publication Editor Mark Milligan, or 2019 UGA President Peter Nielsen (contact info below). Authors will receive detailed information on preparation and submission of an electronic manuscript upon acceptance. Please contact any of the editors with questions.

Please submit the following by June 30, 2018:

Author name(s)  Email (primary)
Author affiliation(s)  Phone (primary)
GeoSights title(s)  Phone (secondary)
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American Geosciences Institute (AGI) and the American Institute of Professional Geologists (AIPG) are pleased to announce our newest course as part of the Geoscience Online Learning Initiative (GOLI). *An Introduction to Landslides and Mass Wasting* is an on-demand course in which learners can register and access all content, materials, and assessments free of charge. The instructor is Dr. Robert Font, CPG.

This course is designed to be an introduction to the subject of landslides or mass wasting. Landslides or mass wasting occur in both solid bedrock and in poorly-consolidated sediments. Concerning the latter, loose sands, clays and soft shales can prove to be quite problematic. These type of strata are highlighted in our discussions. We will start with a basic review of soil mechanics and strength of materials, as a precursor to our coverage of the topic of landslides. We will discuss the causes of landslides, their form and classification, as well as methods of analysis, prediction and prevention. It is our hope that the material covered in this course will provide you with a firm background and motivate you to explore this important subject in greater depth.

This course is ideal for students and early-career geoscientists interested in learning more about the landslides and mass wasting. It is a great resource for teachers and faculty to introduce these basic concepts in an applied context. Feel free to register for the course and peruse the content to learn more!

For more information about this course, including registration details, please visit [our webpage here](https://goli.americangeosciences.org).

Please contact AGI’s Workforce Development Specialist Heather Houlton (hrh@americangeosciences.org) with any questions about other GOLI offerings.

**Additional GOLI Courses**

- [The Lower Cretaceous of Texas](#)
- [Well Logs and Log Analysis for New Hires](#)
- [The Basics of Seismic Petroleum Exploration for New Hires](#)
- [Explore our full course offerings at](https://goli.americangeosciences.org)
The Utah Geological Survey (UGS) recently released the Utah Geochronology Database (https://geology.utah.gov/apps/geochron/) that contains ages and related dating information of sampled geologic materials (soil and rock) using argon (40Ar/39Ar), fission track, luminescence (TL, IRSL, and OSL), radiocarbon (14C), rubidium-strontium (87Rb/87Sr), or uranium-thorium-lead (238U-235U/206Pb-207Pb) dating methods and were analyzed for a variety of geologic-related projects by the UGS, U.S. Geological Survey (USGS; incorporates Utah data from the legacy National Geochronological Database) and others. Additional data from UGS projects will be added in the next year. As the database is expanded in the future, age results from other geochronologic dating methods are anticipated to be added. Donations of geochronologic data in Utah are appreciated, so that these data can be permanently archived and discoverable and available to all users. Please contact Steve Bowman (stevebowman@utah.gov, 801-537-3304) if you have data to donate.
ANNUAL CONFERENCE UPDATE
“Engineering Geology for a Sustainable World” September 15-23, 2018 • San Francisco, California
Still time to sign up! - Complete Meeting Details and to Register [aegweb.org]

http://www.utahpaleo.org/

June 27
Gastonia Chapter Meeting

Brian Davis, University of Louisville, will give us an update on his team’s work at the Cisco Mammal Quarry.
Wednesday, June 27, 6:00 PM, Zions Bank conference room, 330 S Main St, Moab, Utah. Free and open to the public.

Gastonia Chapter Meeting

Ben Burger, associate professor of geology at Utah State University’s Uintah Basin Regional Campus will present When Life Nearly Died: the Permian-Triassic Boundary of Utah.
Wednesday, July 25, 6:00 PM, Zions Bank conference room, 330 S Main St, Moab, Utah. Free and open to the public.
Utah Valley University Trenching Opportunity

As a part of the 2018 UVU Geology Field Camp, the UVU Geology Department will be opening a trench across a trace of the Thousand Lake Fault just south of Sunglow Campground in Bicknell, Utah. The map below shows the likely location of the trench – on State Trust Lands. Students will complete consultant-style logging of the trench as a part of their one-week investigation of this mapping area. The trench will serve as a reconnaissance study, documenting any stratigraphic/structural evidence of paleoseismicity and for collecting soil.

The trench will be open Tuesday June 5th – Sunday June 10th. You are welcome to stop by any of these days for a visit if you have time. There will not be a formal trench review, but if you all are able to come as a group towards the end of the week then I guess that would be more like a trench review.

Here is a link to Bob Biek’s recent geologic map from this area:

Nathan Toke
UVU Geology Department
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(unless otherwise indicated, area code is 801)

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