

# ALASKA GEOLOGY

Newsletter of the  
*Alaska Geological Society*



## Interactions among inherited plate boundaries, slip rate gradients, and lithospheric structure in the Alaska Range, southern Alaska

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Continental strike-slip fault systems commonly display along-strike variability in slip rate, which is balanced in the short-term by surface uplift or subsidence. If the slip rate gradient persists through geologic time, then modifications to the crustal/lithospheric structure of the strike-slip fault system should be recorded in the geologic record. In this presentation, I will describe my work unraveling the geologic evolution of the eastern Alaska Range, southern Alaska, as rocks and topography in this region record a ca. 30 Myr slip-rate gradient on the master strand of the Denali fault. Using bedrock geologic mapping, geochronology, and thermochronology, I will show how right-lateral slip from the master Denali fault is transferred into shortening in a reactivated suture zone. Integrating my findings with regional geologic and geophysical datasets reveals that: 1) reactivation of the suture nucleated an imbricate thrust system that absorbs the convergent component of oblique plate motion across the Denali fault system, 2) shortening and associated crustal thickening across the Alaska Range record a protracted slip-rate gradient on the master Denali fault, and 3) the slip-rate gradient, crustal thickening, and topographic uplift are likely consequences of oblique flat slab subduction along the southern Alaska margin.

### ***AGS Meeting***

Date & Time: Thursday, February 17; Announcements 11:45 am, Talk 12:00 – 1:00 pm  
Program: Interactions among inherited plate boundaries, slip rate gradients, and lithospheric structure in the Alaska Range, southern Alaska  
Speaker: Trevor Waldien, South Dakota School of Mines and Technology  
Place: Virtual online presentation  
Reservations: Reservations are not required  
Login: For instructions on how to log in see: <http://www.alaskageology.org/events.html>  
How to Join: Join with Google Meet: <https://meet.google.com/ysi-ifeq-foj>  
or join by phone: (US) +1 505-340-2083; PIN: 733 728 346

## **About the Speaker:**

Trevor Waldien is an assistant professor in the Geology and Geological Engineering Department at the South Dakota School of Mines and Technology. He and his students' research addresses the origin and evolution of major structures in orogenic belts through the multidisciplinary lens of structural analysis, geo- and thermo-chronometry, and petrology. Prior to his position at SDSMT, Trevor earned a Ph.D. and M.S. from UC Davis, and B.S. from Oregon State University.

Trevor Waldien in the mountains around the Denali fault with the Delta River in the background



## **From the President's Desk:**

Good day AGS members.

The hours of daylight are increasing and the snowfall excellent for skiing in Anchorage. For this, I am very grateful. AGS members have been active this year attending talks and participating in subcommittee meetings. One outcome is the planning for a technical conference at UAF on Saturday, April 23. The board approved support for this meeting, and Dr. Paul McCarthy submitted the appropriate paperwork to seek approval from the university to host a hybrid format (in-person and online with zoom). A call for abstracts will go out once we know the outcome of being able to meet in person.

Our speakers continue to engage the audience and lend themselves to productive discussions after their talk. Our next speaker is Dr. Trevor Waldien, a former AGS scholarship recipient. Please welcome Trevor when he speaks to us about his research efforts in Alaska!

Take care,  
Laura Gregersen



Alaska Geological Society



## SEEKING DONATIONS FOR AGS SCHOLARSHIP FUNDS

This is a challenging year for students at all levels, and geoscience students in the universities need our support more than ever. When you pay your membership dues this year, please consider a contribution to an AGS scholarship fund. You can also contribute to AGS scholarships through Pick, Click, Give when you apply for your Alaska Permanent Fund Dividend. **AGS is a 501c3 nonprofit organization and all contributions are tax deductible.**

The Alaska Geological Society offers scholarship awards to graduate and undergraduate students who are conducting geoscience research projects in Alaska

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The Alaska Geological Society, Inc.  
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The Alaska Geological Society is an organization which seeks to promote interest in and understanding of Geology and the related Earth Sciences, and to provide a common organization for those individuals interested in geology and the related earth sciences.

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## MEMBERSHIP INFORMATION

AGS annual memberships expire November 1. The annual membership fee is \$25/year (\$5 for students). Lifetime membership is \$250. You may download a membership application from the AGS website and return it at a luncheon meeting, or mail it to the address above.

Contact membership coordinator Kirk Sherwood with changes or updates (e-mail: [membership@alaskageology.org](mailto:membership@alaskageology.org); phone: 907-240-2546)

All AGS publications are now available for on-line purchase on our website. Complete catalogue at: <http://www.alaskageology.org/publications1.html>

## ADVERTISING RATES

Advertisements may be purchased at the following rate: \$200 for 9 monthly issues (September - May) of AGS newsletter (any size up to full page) and companion ad on AGS website for full year (beginning each September).

Contact Jennifer Crews at [jennifer.r.crews@conocophillips.com](mailto:jennifer.r.crews@conocophillips.com) to place ad.

# Pick.Click.Give.

## It's PFD Application Time!

Did you know that you can support the society through Pick.Click.Give? When you fill out your PFD application, just select Alaska Geological Society, Inc. in the list of non-profits and you can help AGS to promote the uniqueness of Alaskan Geology and provide for education, geologic research, and networking to all who are interested as well as provide scholarships to students across a wide range of geologic topics.

<https://www.pickclickgive.org/index.cfm/pfdorgs.info/Alaska-Geological-Society-Inc>

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# Alaska Geological Calendar of Events



Date	Time	Organization	Event	Location
Jan. 20 2022	11:45 am	AGS	Richard Styron, Global Earthquake Model Foundation, Active Tectonics of the North Pacific: Interplate and intraplate deformation in the icy ring of fire	Google Meet
Feb. 17 2022	11:45 am	AGS	Trevor Waldien, Interactions among inherited plate boundaries, slip rate gradients, and lithospheric structure in the Alaska Range, southern Alaska	Google Meet
Mar. 17, 2022	11:45 am	AGS	Edward A. Duncan, Duncan Petroleum Advisors, LLC, Integrated Seismic Stratigraphic, Geochemical Volatiles Analysis and Petrophysical Quantification of a Brookian Foredeep, North Alaska Campanian Margin Multi-Billion Barrel "Super Trap"	Google Meet

**AMA:** Alaska Miners Association; **AGS:** Alaska Geological Society; **GSA:** Geophysical Society of Alaska

**AAEP:** Alaska Association of Environmental Professionals; **SPE** Society of Petroleum Engineers;

**UAA** University of Alaska Anchorage.

## Membership Note

Membership renewal is November 1; annual dues are:

*Full member - \$25*

*Student member - \$5*

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