

## GEOPHYSICAL SOCIETY OF ALASKA LUNCHEON

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### **Continental consequences of collision: landscape-altering deformation of the northern Alaska Range thrust system**

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#### **ABSTRACT**

Alaska represents a geomorphic frontier, where extreme collisional tectonics drive the rapid rise of North America's highest topography hundreds of kilometers inland of the continental margin. This topographic growth is achieved via seismogenic dislocation of southern Alaskan lithosphere along the Denali Fault system. A fraction of this dislocation results in indentation of the continental interior north of the Denali Fault, as evidenced by mountainous terrain developed above a series of north-vergent folds and faults collectively termed the northern Alaska Range thrust system. Across this system, rates of crustal deformation and the associated landscape response are poorly constrained. This talk will highlight recent research linking earthquakes, rock uplift, fluvial incision, and climatic change across the northern Alaska Range thrust system since late-Pleistocene time.

#### **BIOGRAPHY**

Adrian Bender is a geologist with the U.S. Geological Survey in Anchorage, Alaska and Seattle, Washington. He commonly uses cosmogenic nuclide and luminescence dating techniques along with digital topography analysis in field-based studies of interactions among river processes, climatic change, and active tectonics at thousand-to-million-year timescales. These studies address basic questions about landscape development, earthquake hazard, and placer-type resource potential.

Adrian earned his BS in Geology at University of Alaska, Anchorage in 2012, and his MS in Geology at Western Washington University in 2015. He is tolerated by a patient wife and a sorta lazy cattle dog.

#### **PUBLICATIONS**

Bender, A.M., Amos, C.B., Bierman, P., Rood, D.H., Staisch, L., Kelsey, H. and Sherrod, B., 2016. Differential uplift and incision of the Yakima River terraces, central Washington State. *J. Geophys. Res.*

Bender, A.M., Lease, R.O., Corbett, L.B., Bierman, P. and Caffee, M.W., 2018. Ongoing bedrock incision of the Fortymile River driven by Pliocene–Pleistocene Yukon River capture, eastern Alaska, USA, and Yukon, Canada. *Geology*.

Bender, A.M., Lease, R.O., Haeussler, P.J., Rittenour, T., Corbett, L.B., Bierman, P.R. and Caffee, M.W., 2019. Pace and process of active folding and fluvial incision across the Kantishna Hills anticline, central Alaska. *Geophys. Res. Lett.*