

Brandon Graham (USGS), In situ ^{10}Be modeling and terrain analysis constrain subglacial quarrying and abrasion rates at Sermeq Kujalleq (Jakobshavn Isbræ), Greenland

Abstract: Glacial erosion is one of the most prominent characteristics of glaciers, however, understanding the rate that glaciers erode is difficult to quantify due to the obfuscated nature under a mountain glacier or ice sheet. Most observations of erosion rate are from sediment budget estimates of mountain glaciers, but few observations exist for ice sheets. I present a three-dimensional cosmogenic nuclide modeling approach coupled with terrain analysis to an exposed bedrock area from the Jakobshavn Isbrae region of the western Greenland Ice Sheet. The cosmogenic model simultaneously solves for abrasion depth as well as the geometry of a quarried block from multiple cosmogenic nuclide rock samples. This quarried profile is used to estimate the quarried and abraded rock volume for the field area, and the relative importance of abrasion to quarrying.

Bio: Brandon is a new addition to the USGS, recently finishing his PhD at the University at Buffalo in Glacial Geology with a focus on the deglacial history of the western section of the Greenland Ice Sheet and quantifying its erosion rate. His work with the USGS focuses on the Quaternary surficial mapping of the glaciated regions in the Northeast United States and applying near surface geophysical techniques to improving the 3D framework.

Paul Hackley (USGS), Organic Petrology at USGS in the 21st Century

Abstract: Organic petrology is the study of the origin, occurrence, structure, and history of sedimentary organic matter. Since the early 1900s, the USGS has utilized organic petrology investigation for the assessment of the fossil fuel resources of the nation and the world. This talk will examine a brief history of organic petrology research at USGS up to the present-day, focusing on modern microscopy and spectroscopy techniques for the spatially resolved investigation of sedimentary organic matter.

Bio: Paul Hackley is a Research Geologist at USGS in Reston. His research examines the thermal maturity, chemical composition and physical state of sedimentary organic matter in support of energy resource assessment.

Ross Salerno (USGS), The age of dome-and-keel structures in the Pilbara Craton

Abstract: Dome-and-keel structures are a hallmark of Archean cratons, commonly interpreted as the results of crustal overturn events that underpinned the growth and stabilization of continental crust on early Earth. The Pilbara Craton stands out as one of the best-preserved examples of Paleoproterozoic crust available for study. In this study, we investigate the timescales of this process through the integration of garnet and zircon geochronology with microstructural analyses. Our work documents two discrete periods of overturn, between ~ 3.42 to 3.39 Ga and 3.34 to 3.30 Ga. These data suggest that the dome-and-keel structures in the East Pilbara formed quickly, perhaps in a few tens of million years. We also show that these overturn events directly coincided with the emplacement of large volumes of granitic material with broadly chondritic initial Hf and Nd isotope compositions, indicating their derivation from a weakly depleted mantle source. The broadly chondritic compositions of these rocks illustrate a relationship between crustal overturn events on early Earth and the production of juvenile sialic crust in the Paleoproterozoic.

Bio: I am an isotope geochemist primarily interested in understanding the histories of Precambrian terranes and the evolution of the crust-mantle system over geological time. I am originally from New

Jersey, and my undergraduate degree is from Syracuse University, where I majored in Geology and History. I completed my MS degree at the University of Minnesota, Duluth, where I focused on the geochronology and metamorphic evolution of Neoproterozoic rocks in the southern Superior Province. My PhD is from Washington State University, where I worked on Paleoproterozoic rocks in the Pilbara Craton in Western Australia. I am currently a Mendenhall Postdoctoral Fellow at USGS, where I've just started a new project focusing on the Paleoproterozoic tectonic history of the upper Midwest in Michigan.