Processes of exfoliation-induced rock falls: Recent studies from California's Sierra Nevada

Granitic rocks in the Sierra Nevada are known for their dramatic displays of exfoliation – the "peeling off" of the outer layer of rock that often manifests itself in massive arches and domes such as found in Yosemite and Kings Canyon National Parks, among many other high and low peaks in the Sierra Nevada mountains. When exposed in vertical exposures, these exfoliation "sheets" (as they are often called) can fracture and break off, causing potentially hazardous rock falls. But what causes fracture and over what time scales might exfoliation-related fracture occur? This presentation will share recent research on the process of exfoliation, and specifically on what types of triggering mechanisms might be responsible for rock falls that occur on hot sunny days when other, more typical, triggers such as precipitation and freeze/thaw action are absent. In this context, an explanation for recent exfoliation events occurring in the Sierra Nevada Mountains of California will be described.

Biography

Brian Collins is a research civil engineer with the USGS Landslide Hazards Program in Menlo Park, California. He has worked in the landslide hazard field for the past 20 years including 10 years with the USGS. Dr. Collins currently leads projects on a variety of landslide topics, ranging from predicting shallow landslides and debris flows in the San Francisco Bay area, to understanding the mobility of the deep-seated 2014 Oso, Washington debris flow avalanche, to studying rock fall hazards in Yosemite National Park. He has degrees from Purdue University (B.S.C.E.), the University of Colorado, Boulder (M.S. – geotechnical engineering), and the University of California, Berkeley (Ph.D. – geotechnical engineering), and is a registered professional engineer in California.