

The Southern Termination of the Stateline Fault, Eastern California Shear Zone, California and Nevada: Preliminary Constraints from Geologic Mapping

Ann Hislop
University of Calgary, Calgary, Alberta
ahislop@ucalgary.ca

and

Dr. Bernard Guest
University of Calgary, Calgary, Alberta
bguest@ucalgary.ca

Abstract

The Stateline Fault forms the eastern boundary of the Eastern California Shear Zone and marks the transition from stable North America to its mobile western margin. This 200 km long fault system lies within 40 km of Las Vegas, Nevada and adjacent to Pahrump, Nevada. Recent geologic mapping has documented ~ 30 km of dextral offset along the fault since ~13 Ma, which translates to a minimum long-term geologic slip rate of ~ 2.5 mm/year. Understanding the spatial and temporal evolution of the Stateline Fault is important for seismic hazard assessment in the region and models for the development of the Eastern California Shear Zone.

We have conducted geologic mapping near the south end of the Stateline Fault in order to resolve the space problem presented by its abrupt southern termination within 30 km of the point of maximum offset. Our preliminary data suggests that at least part of the displacement on the Stateline Fault is absorbed by sub-parallel dextral strike-slip faults to the west of the main fault trace. This is an important result because it potentially resolves the fault termination problem and allows for the possibility that there are unmapped seismogenic faults in the region.