Archeoseismology: Learning about Ancient Earthquakes from the Archeological Record

Oral Session · Friday 8:30 AM, 15 April · Ballroom D
Session Chairs: Tina M. Niemi, Klaus G. Hinzen, and Martitia P. Tuttle

A Summary of the IGCP 567 Archaeoseismology along the Alpine-Himalayan Seismic Zone Project

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Damaging earthquakes on faults typically recur at intervals of centuries to millennia but the seismographs that register them have only been around for about a hundred years. To reduce the hazard from earthquakes, we need a longer record than can be provided from such instruments. Archaeological evidence has the potential to determine earthquake activity over millennial time spans, especially where integrated with historical documents and geological evidence. A key element of the International Geoscience Programme IGCP 567 “Archeoseismology along the Alpine-Himalayan seismic zone” is our contention that archaeological evidence can make a valuable contribution to long-term, seismic-hazard assessment in earthquake-prone regions where there is a long and lasting cultural heritage. The Alpine-Himalayan region is the ideal laboratory because the archeoseismological studies that have already taken root in the Eastern Mediterranean can be extended to neighboring regions and around the world. Archaeology can be used in three important ways to help confront the seismic-hazard threat. First, where archaeological relics are displaced they can be used to find earthquake faults, show in which direction they slipped during the earthquake and establish comparative fault slip-rates. Second, archaeological information can date episodes of faulting and shaking, and identify changes in structural conditions. Third, we can search for ancient signs of seismic damage. The obvious difficulty with the last approach is that it is hard to distinguish between damage caused by an earthquake and that caused by another destructive event, such as war or the natural failure of foundations. Typologies of earthquake-characteristic damage have been proposed but rarely have they been subjected to a critical and systematic analysis. Consequently, “archaeoseismic indicators” are accepted by some earthquake scientists and rejected by others. This presentation will update the community on the field trips, programs, and publications of the IGCP 567 project.