ABSTRACT OF THE THESIS

Seismic Hazard Analysis of Kyrgyzstan using Data from the 2006 M$_W$
5.8 Kochkor earthquake
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Using seismic data from the 2006 M$_w$ 5.8 Kochkor, Kyrgyzstan earthquake, two studies were done: (1) Source parameter study of the Kochkor earthquake and (2) determination of Arias intensity attenuation relation for Kyrgyzstan. In the first study, seismic event locations using both single event (absolute) and double-difference (relative) location techniques were done in order to estimate fault geometry and evaluate effects such as directivity that may enhance ground shaking. Results show that the rupture zone was dipping south at an approximate angle of 45° (+/- 5°), and aftershock locations can also be used to determine rupture propagation. Comparison between the results and geological observations determined that the earthquake occurred on the South Kochkor fault.

The second study uses the seismic data to determine a specific Arias intensity attenuation relationship for Kyrgyzstan, which can be used to estimate earthquake-induced landslide hazards within the area. Comparison of Arias intensity (I_a) calculations using several attenuation relationships with observed Arias intensity obtained from seismic data of the Kochkor earthquake, show that the attenuation relationship that best fits Kyrgyzstan is: $\log I_a = -4.2 + M - 2\log r + 0.44P$. The relationship was tested for two (1992 Suusamyr and 2006 Kochkor) earthquakes in order to determine correlation with landslide reports. Results are consistent with both reports and observations.