Seismic site classification in Alaska for generation of real-time ground shaking maps

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Rapid production of ground-shaking maps following significant earthquakes provides vital information to emergency response agencies, the media and the general public. The real-time ground-shaking maps (ShakeMaps) in Alaska are generated at the Alaska Earthquake Information Center in Fairbanks using waveform data from more than 84 broadband and 28 strong-motion stations. ShakeMaps are produced on the basis of observed ground motion values (peak velocities, peak accelerations, and spectral accelerations) and complemented by calculated values using empirical attenuation relationships. Several region-specific characteristics are important for reliable results, including the uppermost 30m average shear-wave velocities, which are used to estimate site corrections. However, direct measurements of shear-wave velocities require extensive effort and are possible to conduct only in relatively small areas. In this study we attempted to produce a first-order seismic site classification map for Alaska by utilizing the statewide geologic and topographic data. The map portrays the spatial distribution of seismic site classes B, C, and D in Alaska according to classifications defined by the International Building Code. There is a good correlation with the results of shear-wave velocity studies in the Anchorage metropolitan area.