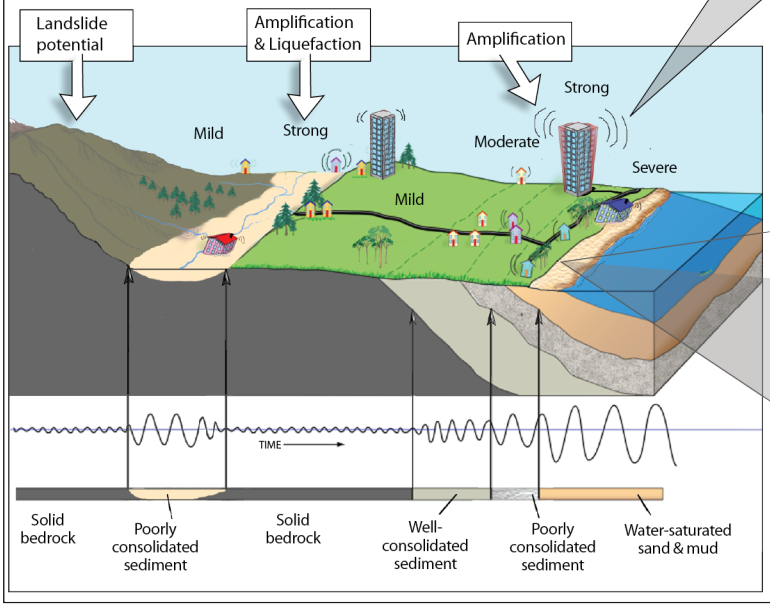
APPENDIX B — EARTHQUAKE INDUCED GEOLOGIC HAZARDS

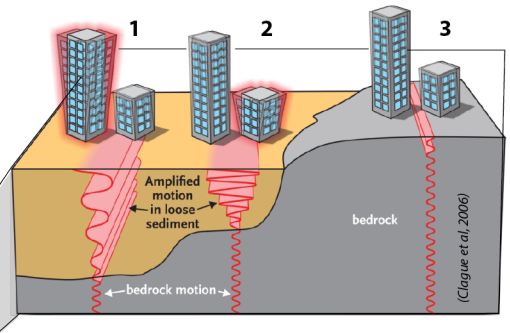
The following images show: A) Amplification, B) Liquefaction, and C) Landslides.
For larger version of the the left image in A), go to: Earthquake Hazard Maps & Liquefaction: Alaska emphasis.

A. Ground Shaking Amplification

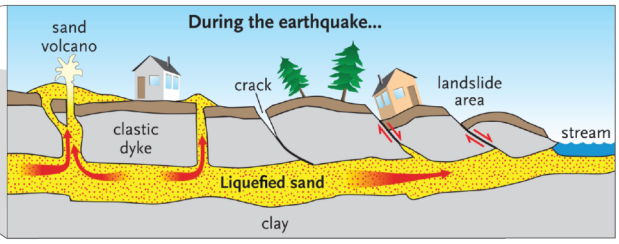
Why does ground shaking from an earthquake change so much with location?

The figure below shows that seismic waves traversing solid bedrock have low amplitude & high frequency. In weaker less-consolidated material, seismic waves oscillate with higher amplitude but with a lower frequency. Imagine dropping a rock on concrete and recording the vibration compared to dropping a rock on a vat of Jello©.





Amplification—*Tall buildings on thick unconsolidated sediments (1 & 2) such as river deltas or ocean shorelines, will be more strongly shaken than those lying directly on bedrock (3). Low-frequency, long-period seismic waves are amplified as they enter the thick sediment pile. Tall buildings resonate with high-amplitude, low-frequency seismic waves (1), but if the waves are high-amplitude but higher-frequency (2), smaller buildings will be affected.*



Liquefaction & Seismic Landslides—*Liquefaction of water-saturated silt or sand may cause the ground to lose strength, fracture, and slide downhill during an earthquake, damaging or destroying buildings and other human works.*

B. Liquefaction

Liquefaction in Christchurch New Zealand, Tuesday 22 February 2011. Image source: Mark Lincoln.

C. Landslides

Houses in the Magnolia Bluffs area overlooking Puget Sound that were struck by a rapidly moving landslide. (USGS Photo)