It has been shown that the amount of amplification of earthquake ground motions by "soils" is correlated to its shear wave velocity. Based on this relationship, a classification has been put forward by the National Earthquake Hazard Reduction Program and used in the 1997 Uniform Building Code which classifies the upper 50 feet of "soils" by its average shear wave velocity. In the Midwest, the Central U.S. Earthquake Consortium (CUSEC) State Geologists of Arkansas, Illinois, Indiana, Kentucky, Mississippi, Missouri, Ohio and Tennessee have worked together to produce this map (at an original scale of 1:250,000 or 1 inch equals about 4 miles) that offers a consistent use of this soil amplification classification based on a small number of measured shear wave velocity values of Midwest unconsolidated geologic materials (UGM). These derivative maps were produced from existing geologic maps which represented either 3-dimensional surficial materials to various depths or surficial data which was extrapolated in the third dimensions by geologists familiar with the area. The CUSEC State Geologists are actively gathering more shear wave velocity information of soils in the Midwest.

In order to estimate what an area may experience from an earthquake event, the information on this map needs to be combined with a map of expected ground motions from an earthquake. The Federal Emergency Management Agency’s earthquake loss estimation program (HAZUS) performs such an analysis.