

ROCK AND SOIL TYPES IN THE REGION

Soft soils are widespread in the region. They can amplify ground shaking to damaging levels even in a moderate earthquake.

Knowing the geologic distribution of the rocks and soils in a region is critical for assessing earthquake losses. We used different data sources and procedures to map the modification of ground shaking by these local geological factors, employing a prescribed HAZUS format. The sources include:

NEHRP Site Classification Scheme

The 1997 National Earthquake Hazard Reduction Program (NEHRP) provides rules for classifying sites according to the stiffness of geological materials. The site classes range from A to E, where A represents the hardest rocks, and E the softest soils. These classifications are used in all figures on this and the next few pages. Soft soils amplify ground shaking and increase building damage and losses. HAZUS uses predetermined NEHRP ground shaking amplification factors for each of these soil classes.

State Geological Maps

To classify sites according to the NEHRP site classes A through E, we obtained geotechnical data from a variety of different sources with varying quality and spatial resolution.

In the regions outside Manhattan (see map on this page) and in the surrounding Tri-State region of NY-NJ-CT (see next page), site classification is based on lower-resolution surface geology maps provided by the different state geological surveys. The three states mapped similar rock and soil units differently. We established rules by which we assigned geological units on the Site Maps to the NEHRP site classes A through E. This procedure resulted in only minor differences in site classes across state boundaries. There is, however, good agreement for the more critical, soft-soil classes that amplify the ground motions. Since soft soils

are widespread in this region, they can amplify ground shaking to damaging levels even in a moderate earthquake.

For loss computations in HAZUS, the maps of site classes in the NY-NJ-CT region outside Manhattan (on this and the next page) were overlain with the outlines of census tracts.

Census tracts are small areas within a county or city used for population and related statistics. We assigned a single site class to each census tract based on the site class that was found at the center of each tract. More complex schemes are possible but were not employed here.

