

energy. Many major earthquakes begin 10-15 kilometers beneath the surface, near the bottom of the brittle portion of the crust (see dePalo and Slemmons, 1990). Then the fault rupture propagates up towards the surface. In the lower crust, deeper than 15 kilometers, the rocks are hotter and, when subjected to plate motion stresses, tend to be ductile and flow plastically. Thus the majority of earthquakes shown in Figure 1-5 and Plate 1-1 are shallower than 15 kilometers. However, there are notable exceptions.

The San Geronio Pass fault zone exhibits some of the deepest earthquakes in southern California. Here, abundant seismicity occurs at depths of 15 to 25 kilometers (Nicholson et al, 1986; Seeber and Armbruster, 1995; Magistrale and Sanders, 1996). This is thought to be because upper crustal material has been pushed deeper due to motion within this complex fault system. This upper crustal material is still relatively cold and brittle, and therefore continues to store strain energy.

1.3.3 Earthquake Geographic Information System Coverage for Riverside County

As part of this study, seismic data were imported into a geographic information system (GIS) coverage for Riverside County, described below. The data utilized were seismicity catalogs dating from 1931 (the beginning of the Southern California Seismic Network) to the present. Data tables linked to each event include magnitude, depth, and year.

Coverage Description: Earthquake locations in Riverside County (Plate 1-1)

Coverage distribution file name: quakes.e00; quakes3.e00 (quake.e00 represents all earthquake locations under 3.0. quakes3.e00 represents all earthquakes over 3.0.)

Coverage Area: Riverside County

Source: Earth Consultants International

Accuracy: The earthquakes are plotted to an accuracy of 1:24,000.

Earthquake Location References:

Earthquake locations for events occurring from 1858 to 1931:

Blake, T. F., 1996, EQFAULT- Computer software for deterministic site parameters, Version 2.20.

Earthquake locations for events occurring between 1932 to 1980:

Earthquake data recorded by the Southern California Seismic Network (SCSN, which is operated jointly by the Seismological Laboratory at Caltech and the U.S. Geological Survey, Pasadena, California), and catalogued by the Southern California Earthquake Center Data Center (SCEC-DC).

Earthquake locations for events occurring between 1981 to 1999:

Hauksson, E. (in press), Crustal structure and seismicity distribution adjacent to the Pacific and North America plate boundary in southern California: submitted to Journal of Geophysical Research.

Figure 1-5: Seismicity of Riverside County