

Learning from Earthquakes

The Paez, Colombia Earthquake of June 6, 1994

On June 6, 1994, at 15:47 local time (20:47 GMT), a 6.4 Richter magnitude earthquake occurred in the southwest of Colombia. The epicenter was located at 2.9 degrees North, 76.08 degrees West, close to the town of Paez. The depth of the quake was measured at 10 km. More than 100 aftershocks have been recorded after the main event. The earthquake was felt in the entire central part of the country.

The earthquake was produced by a satellite fault of the Romeral faulting system that crosses the country from the border with Ecuador to the Caribbean coast. The epicenter is located 6 km from the Huila Volcano, a snow peaked mountain that reaches an altitude of 5,265 m above sea level. The volcano has been dormant for the last 50,000 years, although some seismological activity associated with the volcano has been reported.

Six hundred and twenty houses were either destroyed by the earthquake or the associated landslides and flood, and 2,400 were reported damaged. No major engineered structures were affected. Modified Mercalli Intensities of between VI and VII were reported in numerous towns in the epicentral area (up to 40 km from the epicenter). In the cities of Cali, Popayan and Neiva, all of them located approximately 100 km from the epicenter, non-structural damage was reported, and the Mercalli intensity was reported at V to VI. Non-engineered construction, and special unreinforced masonry structures behaved poorly. Structures de-

signed to code in the epicentral region behaved extremely well with almost no damage, structural or non-structural, reported. The Betania Hydroelectric Project, located about 120 km from the epicenter, reported no damage, although fallen trees from the land slides and mud flood reached the reservoir.

Numerous local landslides were triggered by the earthquake. The earthquake occurred during the rainy season which helped promote the occurrence of the land slides. Almost all the mountains surrounding the Paez River Valley show the scars of the landslides.

The earthquake also caused a very large mud flood in the Paez River Canyon. The Paez River flows out of the glaciers of the Huila Volcano, and runs to the Magdalena River at the Betania Reservoir. The mud flood reached heights of 30 meters in some places. The road that follows the Paez River Valley was destroyed by the mud flood in several places, as were 10 bridges that cross the river. Some towns, like Irlanda, were affected by the three earthquake-induced phenomena: the lower part was affected by the flood, the upper part by a local landslide, and the rest of the town by the earthquake ground shaking. This type of problem was encountered in most of the towns in the valley of the river.

Approximately 200 people were killed and another 100 were reported missing. Most of the deaths were caused by the mud flood. Some 14,000 inhabitants of the area were affected by the earthquake.

This report was submitted by Luis E. Garcia (EERI, 1975), and Juan Martinez of the Colombia National Seismological Network.

Voices from the Past

The July 9, 1950 Colombia Earthquake

The following information is excerpted from an article from the July 10, 1950 New York Times.

Bogota, Colombia, July 9—A series of violent earthquakes destroyed mountain villages in North-eastern Colombia today, leaving hundreds feared dead and injured.

Mountain ranges in the oil-rich country near the Venezuelan border quivered in a series of eight heavy shocks. More than 150 bodies already have been recovered in the region of Cucuta, reports reaching here said.

Shocks were also felt throughout Peru, Ecuador and Chile. There was new terror in Cuzco, Peru, this ancient Inca city of the high Andes, where recent earthquake victims still live in tent cities. (*EERI editor's note - This was the May 21, 1950, magnitude 6.0 event in Cuzco, Peru.*) Three villages were reported wiped out by the earthquakes in Northeast Colombia and seven others were damaged. Each heavy quake was followed by a series of minor tremors.

A Jesuit priest, Dr. Jesus Ramirez, director of the observatory at Bogota, said the quakes were caused by the massive Andes Mountains settling into the earth.

In Cucuta, a city of 77,000, the central Cathedral and other large buildings were shattered. It was feared more bodies might be dug from the wreckage.

Thousands of terrorized Indian natives fled into the countryside, away from the mountains where they feared landslides or rocks crashing down the slopes.