HOLOCENE SEISMICITY AND TECTONIC ACTIVITY OF THE QUITO FAULT (ECUADOR): A PALEOSEISMIC HISTORY RECORDED IN LACUSTRINE SEDIMENTS

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INTRODUCTION

Over the 460 years of Ecuadorian written history, several seismic events were registered, some of them reaching intensity IX (MSK) in Quito (CERESIS, 1985; Del Pino and Yepes, 1990). From the various seismogenic sources able to produce damage in the city, the Quito Fault is thought to be able to produce higher intensities in case of a rupture of the fault along its entire length (45 Km), making this structure the potentially more dangerous seismogenic source for the city. In the historical record, such activity of this fault was only registered once in 1755, were part of this fault could have ruptured producing an intensity VIII-IX (MSK) in Quito (Del Pino and Yepes, 1990). In order to assess the recurrence of major events, clearly overpassing the historical time span, it has been necessary to study the geological record. The paleoseismicity was evidenced by mean of the analysis of earthquake-induced paleoliquefaction horizons produced in a lacustrine environment. Evidences of the regional and local seismic activity were observed during the analysis of the Holocene sediments of Quito, as well as evidences of the Quito fault activity such as synsedimentary faults and seismotectonic deformation.

The Quito reverse fault system is active at least since the Late Pleistocene. The fault dip to the west below the city. Its Quaternary activity has created a series of tectonic ridges bordered to the east by a scarp of about 500m high due to compressive folding at the upper termination of the fault (Winter, 1990; Soulas *et al.*, 1991; Ego, 1995). Normal faulting occurred at the back of the overriding block and created a kind of piggy back basin filled by fluvial-lacustrine deposits until the 17th century. The sedimentological analysis of these deposits allowed us to precise the paleoseismic history of Quito for the rest of AD. times (pre-Hispanic history). A relatively complete paleoseismic record was observed in the northern basin, where a particular exposure in the "Calle Pinzón" shows the succession of at least 20 earthquake-induced contorted bedding horizons (Fig. 1). These paleoseismic features occurred at the bottom of lakes, at the water - sediments interface, as shown by erosional disconformities (Fig. 1). From the comparizon between published examples (Sims, 1975), relation between horizontal ground acceleration and intensity such as log