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Application of the INQUA Scale of geologic effects to the Cariaco 1997 (Venezuela) and Arequipa 2001 (Peru) earthquakes

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The geologic or ground effects of the Cariaco 1997, Venezuela, and Arequipa 2001, Peru, earthquakes have undergone field reconnaissance in the following days after the main shock by the author. The Cariaco event showed both primary and secondary geologic features, while the Arequipa June 23, 2001 event, being a subduction earthquake, only induced secondary effects, but also had tsunami waves associated. The latter event was essentially studied in terms of its liquefaction distribution, as well as size and frequency of sand blows. Instead, mapping was undertaken for both induced effects (liquefaction and mass wasting) and ground rupture along the El Pilar fault after the Cariaco July 09, 1997 earthquake.

Both events have undergone macroseismic studies by other teams and isoseismal maps were constructed for them, using the Mercalli Modified Intensity Scale (MMI). Based on the ground effects reported during both earthquakes, INQUA Scale intensities (ISI) have been assigned to as many sites as possible for each earthquake. The main conclusions drawn from this assessment are: (a) The INQUA Scale definitely helps to define the epicentral intensities for values VI and higher; (b) it increases the intensity accuracy for the higher values (VIII to X), where other scales fail to assign any value, since geologic phenomena are not taken into account; and (c) some discrepancies are found between the MMI and ISI for particular sites or localities, which are to be imputed to specific site effects.