



Contributions the study of the 1934 South-Western Panama Earthquake sequence form old instrumental and macroseismic data

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At the South-Western margin of the Isthmus of Panama, the Cocos, Nazca and the Panama Microplate joint in a triple junction. Here the Panama Fracture Zone which acts as the limit between the Nazca and Cocos plate subducts in an oblique and shallow manner. This is the region with the highest seismic hazard in Central America. On July 18, 1934, the largest earthquake in Panama (M_s 7.7) during the XX Century occurred at the northern end of the Panama Fracture Zone and caused extensive damage in the border region of Panama and Costa Rica. In the two subsequent days six aftershocks with magnitude greater than 6.0, were recorded.

In the present research, we have relocated the six main events using various phases from old seismic bulletins and historical seismograms and re-estimated the focal mechanism of the main event and the two strongest aftershocks. From digitized historical seismograms we have determined the moment magnitude for the main event and aftershocks. Additionally we gather new macro seismic information from Panama and Costa Rica that, from one side, allow a better characterization of the whole sequence and, from the other side, produce an improved and more complete isoseismal map of the main event.

We conclude that all the events of the sequence occurred offshore at the Panama Fracture Zone and were shallow ($h < 25$ km), with the three strongest events showing a strike slip type of faulting. The relocated epicentre of the main event is at 7.89N, 82.56W with a recalculated magnitude of M_w 7.4. The strongest aftershock, on July 21, was the northernmost, with its epicentre very close to the coast. This may explain, in part, why this event seems to have caused most of the damage produced by this sequence.