

Active tectonics and first paleoseismological results in Faial, Pico and S. Jorge islands (Azores, Portugal)

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Abstract

The neotectonics of the islands of Faial, Pico and S. Jorge (Azores) is presented. Preliminary paleoseismology data from trench exposures across three active fault zones (Lomba do Meio, Lagoa do Capitão and Pico do Carvão faults) complement the information. Radiocarbon age constraints of paleoearthquakes suggest clustering of surface rupturing events. Slip rates deduced from paleoseismology analysis range from 0.10 to 0.40 cm/year and validate long-term slip rates obtained by neotectonic studies (using Pleistocene markers). The studied faults allowed a preliminary seismic hazard assessment: magnitudes of the largest paleoearthquakes, determined from slip per event range from $M_w = 6.9$ to 7.1, and maximum expected magnitudes, estimated from rupture length or rupture area, vary from $M_w = 6.4$ to 6.8. The former M_w estimates are in closer agreement with the magnitude of the major historic and instrumental seismic events in the archipelago, even though the used empirical relations between magnitude and rupture parameters may not be the most adequate due to the unique tectonic setting of Azores.

Keywords

Azores; neotectonics; active faulting; paleoseismology; seismic hazard

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
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