



Earthquake cycle associated with active strike slip faults in central Panamá

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The rigidity of the Panamá Isthmus is currently under debate, with important implications for seismic hazards to the Panamá Canal and Panamá City. Whereas Panamá has traditionally been described as a non-deforming microplate caught between a number of larger tectonic plates, new paleoseismic data collected at a limited number of trench sites in association with the ongoing expansion of the Panamá Canal may challenge the validity of the rigid microplate hypothesis. Crustal velocities from a new, ~100 km aperture, 5-station continuous GPS network constructed across the Rio Gatún, Limón, and Pedro Miguel fault zones confirm that these fault zones are active, forming a system of faults that traverse central Panamá in close proximity to the Panamá Canal and Panamá City. However, the slip rates inferred from these new geodetic data are lower than the geologic rates when using an elastic halfspace model. Differences among previous geodetic investigations, which concluded that Panamá is rigid, and the geological slip rate estimates are explained by earthquake cycle effects associated with long recurrence intervals relative to lower crust and upper mantle Maxwell relaxation times. Late in the earthquake cycle the geodetic strain field is broadly distributed, giving the false appearance of low seismic hazards.