

Rupture process of the 1979 Tumaco, Colombia, earthquake and rupture characteristics along the Ecuador-Colombia subduction zone

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The 1979 Tumaco earthquake was the second largest earthquake in the Ecuador-Colombia subduction zone after the 1906 Ecuador-Colombia earthquake. However, previous studies of the 1979 event only estimated the seismic moment and the rupture velocity from surface-wave records [Kanamori and Given, PEPI, 1981] and the source duration from P-wave records [Beck and Ruff, JGR, 1984]. In order to evaluate the risk of earthquake and tsunami in this region, it is important to estimate the spatial and temporal slip distribution of the 1979 earthquake and its relationship to the 1906 earthquake.

We inverted teleseismic P-waves at WWSSN stations to investigate the rupture process of the 1979 Tumaco earthquake. We calculated Green's functions using the method of Kikuchi and Kanamori [BSSA, 1991] and applied the waveform inversion scheme of Kikuchi *et al.* [EPS, 2003] to image the spatio-temporal slip distribution. Our inversion results indicated that the large slip of the 1979 event occurred in the northeastern part of the source region. The average plate coupling ratio in the 1979 earthquake source region was estimated to be only 30 % [White *et al.* EPSL, 2003]. From this coupling ratio and the average slip of 2.4 m in our slip model, the recurrence interval of the 1979 earthquake was estimated to be 174 years. This suggests that the 1906 Ecuador-Colombia earthquake did not rupture the source region of the 1979 Tumaco earthquake. This interpretation is consistent with that the tsunami source model of the 1906 event proposed by Yoshimoto and Kumagai [AGU fall meeting, 2016].

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