



Geomorphic study of the Chololo Fault (South Peru): Implications for fore-arc deformation of the Andean Cordillera.

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The subduction of the Nazca plate below the Central Andes is characterized by a curvature of the subduction zone, referred to as the Arica Bend. Crustal faults perpendicular to the trench have been described both in northern Chile and southern Peru in that part of the Andean fore-arc. The Chololo fault, located near Ilo (17°S) is a major structure perpendicular to the trench. Its position marks the southern limit of the aftershocks of the June, 23, 2001, subduction earthquake ($M_w=8.4$). The aim of this work is to better constrain the tectonic activity of this fault that forms the present-day northern boundary of the Arica Bend seismic gap. Analysis of aerial photographs, satellite images and Digital Elevation Models complemented by field observations allowed to identify several geomorphic markers. The Chololo fault is a 40 km long transtensive crustal structure, that recorded left-lateral kilometric displacement and a vertical offset (few hundred of meters) associated to regional extension. We suggest that the left-lateral strike-slip movement in the fore-arc area may be related to the difference between an important shortening rate along the Arica Bend and a lower one in the area immediately to the north.