COMMENTS AND REPLIES

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Comment

Comment to "Open-source archive of active faults for northwest South America" by Gabriel Veloza, Richard Styron, Michael Taylor, and Andres Mora in *GSA Today*

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Active faults maps and instrumental seismic and geodetic data represent first-order observables of crustal deformation processes. These are crucial parameters allowing the definition of seismotectonic hazard, extending the regional instrumental time window (30 yr). Indeed, Quaternary active faults offer information over longer time spans (10^6 yr).

Along the Pacific South American margin, active faulting is a common phenomenon affecting the upper plate, building topography or accommodating deformations along the entire Andean mountain range (e.g., Atlas PMA). As stated by Costa et al. (2010):

> Because of their tectonic setting, many areas in Latin America and the Caribbean have been or could be seriously damaged by earthquakes. Considering the severe social and economic effects that these natural catastrophes can produce, identification and characterization of potential seismic sources with and without previous seismic records are mandatory for land-use planning and decision-making purposes.

In a South American scientific frame, 40 years of common efforts and regional studies give rise to a dense literature, available in several types of international publications, ranging from geological survey maps to review papers and even open-source databases that are not cited in this paper (for example: INGEMMET, http://geocatmin.ingemmet.gob.pe/geocatmin/). Each of these studies have provided valuable insights into fundamental processes of deformation affecting the South American crust, such as seismotectonic segmentation, slip rates of active faults, and temporal variability of crustal and superficial deformation through paleoseismic studies. Among these numerous studies, two larger efforts made by geological and geophysical institutes of each Andean country stand out. The first was the International Lithosphere Program (ILP II-2), which published the catalogue on active faults of the Andes in six U.S. Geological Survey open-file reports. The more recent 2009 MAP: GAC project compiled the activity of 776 faults and folds (more than 1,000 segments with proven or suspected activity during the Quaternary) and results of a noticeable international effort (Multi Andean Project–Geosciences for Andean Communities).

We fully agree that any objective and constructive contribution helping to build upon a previously published database is crucial not only to advancing the understanding of Andean mountain building processes, but also for training future students and researchers about the methodological aspects involved in analyzing active deformation. Nevertheless, omitting previously published data without discussion in an open source that is not comprehensive is misleading.

Two short observations:

1. Active faults: Veloza et al. (2012) proposed that "In the south, Peru is dominated by thrust faulting along the forearc …" citing no references (Hall et al., 2012). In any case, no faults are mapped in the Peruvian forearc on Veloza et al.'s Figure 1, and thus these conclusions are questionable. In the same way, this compilation exhibits an offshore Quaternary fault, in connection with the southern transform and the Lesser Antilles subduction plate boundary, unknown in the southeastern Caribbean (OFR Venezuela and PMA map).
2. GPS Data: This paper includes GPS-measured velocities for Ecuador and others GPS stations cited, as issued from the U.S. Geological Survey web page. For the most part, these GPS velocities are for stations on active volcanoes and should not be considered as representative of tectonic movements in the region. Furthermore, those velocities shown with purple vectors in Veloza et al.'s Figure 2 are not in the same reference frame. Some are in a North America fixed-reference frame, but the other vectors shown are in a South American fixed-reference frame.

In conclusion, by not including the large sets of data documented here, the Veloza et al. compilation is an incomplete work. This highlights the needs of further regional collaboration and local expertise in such large-scale projects to improve the knowledge and understanding of the active structures in South America.

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Note: Other country reports are available as USGS Open-File Reports 98-481 (Costa Rica), 98-779 (Panama), 00-180 (Argentina), 00-283(Bolivia/Chile), 00-437 (Managua area, Nicaragua), and 02-230 (Brazil).

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