

COMMENTS AND REPLIES

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Reply

Reply to comment to “Open source archive of active faults for northwest South America” by Laurence Audin et al., 2013

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Obtaining a detailed understanding of seismic hazards is an important societal application of the geosciences; highlighted by multiple and independent groups working in parallel in different locations. Furthermore, replication between groups could be viewed as verifying results, which is critical because of the difficulty in validating seismic hazard models. For this reason, we released the Active Tectonics of the Andes (ATA) v.1.0, which is the first iteration of an open-source and collaborative endeavor to be utilized by the community, but it may also be commented on or edited by individuals concerned with seismic hazards. We make no claim that ATA is complete; in fact, we claim the opposite, and invite participation from the community in the continual improvement of the ATA database.

We thank Audin et al. for their suggestions of additional sources for active faults, which is reviewed and incorporated into our open-source database. Structures we add from these sources retain the references to the original work, similar to structures already in the database that are not derived solely from our own observations. We also thank Audin et al., for comments on specific active structures and GPS velocities; crucial to developing a thorough understanding of seismic hazards locally, and regionally - a message board on our associated Web site for the ATA database (<https://github.com/ActiveTectonicsAndes/ATA/issues>) is better suited to such conversations.

Specific comments by Audin et al.:

1. Thrusting in the Peruvian forearc is largely based on interpretation of earthquake focal mechanisms (www.globalcmt.org). Therefore, we did not map in specific structures. Such events are common to offshore Peru where field-based observations are

limited (Stein and Klosko, 2002). However, we note that after submission of our original manuscript, Hall et al. (2012) provides field-based observations of coastal Peru supporting our interpretation.

2. We admit that the GPS sites from the USGS referenced to stable North America is an error on our part. However, GPS data from the same region in a stable South American reference frame (Fig. 2) shows the same first order deformation pattern - Therefore our interpretation remains unchanged. Additionally, Audin et al.'s, assertion that the GPS data are not useful indicators of tectonic displacements because of their proximity to active volcanoes seems unreasonable. First, not all of the stations are located on the eastern flanks of rapidly expanding volcanos, and secondly, the GPS stations consistently indicate an east-northeast directed displacement.
3. Audin et al., note that Web sites exist for downloading information about active faults in Peru. We note that the example cited by Audin et al., does not provide a database that can be downloaded and viewed in standard software, nor does it provide any references to publications (accessed on 6/10/2013). It only provides a digital image of the map pattern of active faults. Therefore, the map needs to be digitized, projected, and imported into any software if a user is interested in using that specific database.

As stated above, the ATA database is not a final product. As such, other available sources need to be included (e.g., Audemard and Robertson, 1996). We thank Audin et al., for providing references that we incorporate into the ATA database. Additionally, we find it puzzling that Audin et al., do not realize that the references they claim we omitted (e.g., Audemard et al. (2000)) are not only cited in our original *GSA Today* article, but they are also referenced for individual structures within ATA 1.0.

Finally, we announce ATA v.1.1 containing an updated and revised mapping of active faults (e.g., the Quito area, D. Villagomez, personal commun.) that also incorporate Audin et al.'s, suggestions (e.g., Hall et al., 2012). ATA v.1.1 can be downloaded (https://documents.ku.edu/xythoswfs/webui/_xy-3855878_2-t_wAMOU57k [link updated 2 Dec. 2013]) and viewed in GMT, Google Earth, or Arcgis.

To more easily facilitate community editing, we also host a development version on GitHub (<https://github.com/ActiveTectonicsAndes/ATA>), which is designed specifically for open-source development. Individuals may download the database, make specific edits, and re-upload the database. Changes may be discussed and merged back into the ATA. In the original collaborative spirit of Veloza et al., 2012, we welcome and encourage comments or discussions on GitHub. This information provides an enormous benefit to societies in northwest South America that are continually faced with seismic hazards, and the scientific community whose role is to try and better understand those hazards.

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