ESC2016-479, 2016
35th General Assembly of the European Seismological Commission

35th General Assembly of the European Seismological Commission
4–10 September 2016 Trieste

From neotectonic data to seismogenic sources in South America: Results and lessons learned from the SARA project

Carlos Costa (1), Julio Garcia (2), Alexandra Alvarado (3), Franck Audemard (4), Laurence Audin (5), Carlos Benavente (6), F. Hilario Bezerra (7), José Cembrano (8), Gabriel González (9), Myriam López (10), Estela Minaya (11), Mónica Paolini (4), Irene Pérez (12), Isabel Santibanez (8), Mónica Arcila (10), Fabrizio Delgado (6), and Marco Pagani (2)

(1) UNSL, San Luis, Argentina (mailcarloscosta@gmail.com), (2) GEM, Pavia, Italy (julio.garcia@globalquakemodel.org), (3) IG, EPN, Quito, Ecuador (aalvarado@igepn.edu.ec), (4) FUNVISIS, Caracas, Venezuela (faudemard@gmail.com) (mpaolini@funvisis.gob.ve), (5) IRD, France (laurence.audin@ird.fr), (6) INGEMMET, Lima, Perú (clbenavente@gmail.com) (fabrigeologo@gmail.com), (7) UFRN, Natal, Brazil (bezerrafh@geologia.ufrn.br), (8) PUC, Santiago, Chile (jcembrano@puc.cl) (ivsantibanez@uc.cl), (9) UCN, Antofagasta, Chile (ggonzale@ucn.cl), (10) SGC, Bogota, Colombia (mclopez@sgc.gov.co) (marcila@sgc.gov.co), (11) OSC, La Paz, Bolivia (minayare@hotmail.com), (12) INPRES, San Juan, Argentina (iperez@inpres.gov.ar)

Subduction earthquakes are commonly regarded as the most significant seismic threat for South America. However, historic destructive earthquakes related to shallow crustal sources have occurred onshore where many important cities, capital towns and critical facilities are settled nearby faults, whose seismogenic capability is known or suspected. Despite this fact, many seismic hazard assessments (SHA) do not consider potentially seismogenic faults at all, or do so only sparingly, in some cases because the required fault data are absent or not available in an adequate format for engineers or for SHA requirements.

The South America Risk Assessment (SARA) project has promoted a closer link between the regional earthquake geology community and the hazard modelers, with the aim of incorporating the crustal hazardous faults as one of the database layers feeding the SARA seismic hazard source model. This task has been undertaken aiming at compiling under homogeneous standards available information on seismically capable structures and upgrading and fulfilling whenever possible key input parameters for SHA.

Existing maps and parametric data of hazardous faults and folds in South America (e.g. 3D geometry and kinematics) have been conceived as fault compilations and not always provide a clear image on the seismic capability of causative structures. Thus, they contain several uncertainties and inconsistencies as which resulted in difficulties to translate and complete the necessary data for SHA requirements. Confronting data harmonization along different regions and settings have proved not to be straightforward, due to different working criteria and epistemic data uncertainties. Capacity building is mandatory for getting the maximum benefit of ongoing and future ventures.

Relevant parameters such as geometry, kinematics, and slip rate for each fault has been compiled under a GIS-supported platform and spatially linked to fault traces. These data could be visualized through the Open Quake Platform provided by the Global Earthquake Model.