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New insights on pre-1900 great earthquakes along the Peru-Chile trench

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The aim of our work is to improve the knowledge of the great ($M \geq 7$) subduction earthquakes occurred along the Peru and Chile trench before the year 1900. We first analysed the studies made available in the Global Historical Earthquake Archive - GHEA (<http://www.emidius.eu/GEH/>), and crosschecked them in order to critically evaluate and improve the data supporting each earthquake. The available macroseismic data were also checked and improved and then used to assess homogeneous parameters. For this purpose we derived a new relation describing the attenuation of macroseismic intensity with distance, specific for subduction earthquakes in the area, based on a revised set of instrumentally recorded earthquakes from the ISC-GEM Catalogue (<http://www.isc.ac.uk/iscgem>) and the related macroseismic data from the CERESIS database (www.ceresis.org).

The new magnitude, location, and - especially - hypocentral depth of the considered earthquakes have been matched with the geometry and characteristics of the subduction plane, in order to check their consistency and to infer the possible geometry of the individual seismogenic sources. The revised earthquake parameters for pre-1900 earthquakes allowed us to re-evaluate the long-term seismic behaviour of the Peru-Chile subduction zone in terms of recurrence intervals and seismic moment release.