

## Characterization and analysis of b-value in the Mw 8.8 Maule 2010 earthquake area

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The study of the frictional structure of the megathrust is important to improve the comprehension of seismic cycle in subduction zones. In particular for recent earthquakes in the Chilean margin, multiple methodologies have been used. One of these methodologies is the analysis of the b-value, which corresponds to the slope of magnitude-frequency distribution of seismic events (Gutenberg-Richter Law), which has been proposed as an efficient stressmeter.

The Mw 8.8 Maule 2010 earthquake ruptured along a segment of 550 km long (34° to 38.5°S) in the Chilean trench, closing the seismic gap of Concepción-Constitución after the 1835 earthquake. During the previous stage of its nucleation there were no observable foreshock features. Furthermore, 10 years before the earthquake, the area between 34°-38°S showed a lack of seismic activity unlike the area north of 33°S in the same time-period. In addition, a year after the mainshock, there are areas which maintain seismic activity, while there are others which once again exhibit a notorious lack of events.

We present the stress distribution before and after the Mw 8.8 Maule 2010 earthquake using computations of b-value, working with seismic catalogues from local networks of Centro Sismológico Nacional (CSN) and Lange et al., 2012 and global network of National Earthquake Information Center (NEIC). We selected an area defined by 32°-40°S and 70°-76°W, in the time frame from February, 2000 to August, 2018. We analysed three time stages: before (2000-2010/02), during the year of the mainshock (2010/02-2011/02), after the year of earthquake (2011/02-2018).

The results compared between catalogues suggest that the parameter b-value strongly depends on the type of catalogue in use (local or global network). The analysis of the spatio-temporal variations shows a segmentation of the Maule megathrust, with clear differences north and south of the rupture, highlighting the presence of a seismic asperity south of the hypocenter, which presents a persistently low b-value in the analysed period.

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