

Damage assessment of the 2015 Mw 8.3 Illapel earthquake in the North-Central Chile

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© 2018, Springer Nature B.V. Destructive megathrust earthquakes, such as the 2015 Mw 8.3 Illapel event, frequently affect Chile. In this study, we assess the damage of the 2015 Illapel Earthquake in the Coquimbo Region (North-Central Chile) using the MSK-64 macroseismic intensity scale, adapted to Chilean civil structures. We complement these observations with the analysis of strong motion records and geophysical data of 29 seismic stations, including average shear wave velocities in the upper 30 m, V_{s30} , and horizontal-to-vertical spectral ratios. The calculated MSK intensities indicate that the damage was lower than expected for such megathrust earthquake, which can be attributable to the high V_{s30} and the low predominant vibration periods of the sites. Nevertheless, few sites have shown systematic high intensities during comparable earthquakes most likely due to local site effects. The intensities of the 2015 Illapel earthquake are lower than the reported for the 1997 Mw 7.1 Punitaqu