



GIS-based 3D modeling and visualization of the Mw7.7, 2007, Tocopilla aftershocks

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The November 14, 2007 Mw 7.7 earthquake nucleated on the west coast of northern Chile about 40 km east of the city of Tocopilla. It took place in the southern part of the of a large seismic gap namely, the Iquique subduction zone segment which is supposed to be at the end of its seismic cycle. The Tocopilla fault plane appears to be the northern continuation of the Mw 8.0, 1995 Antofagasta earthquake. We present a complex 3D model of the rupture area including first hypocenter localizations of aftershocks following the event.

The data was recorded during a mission of the German Task Force for Earthquakes after the 2007 Tocopilla earthquake. 34 seismic stations were recording the aftershocks from November 2007 until May 2008.

In general, subduction zones have a complex structure where most of the volumes examined are characterized by strong variations in physical and material parameters and are far away from a homogeneously layered half space. Therefore, 3D representation of the geophysical and geological conditions to be found are of great importance to understand such a subduction environment.

Using ArcScene as a three-dimensional modeling tool gives us the possibility to visualize the aftershock distribution along the subducting slab and identify clear structures and clusters within the data set. Furthermore we combine the 2007 Tocopilla data set with the 1995 Antofagasta aftershocks which provides a new, three-dimensional insight into the segment boundary of these two events.