

2006 Fall Meeting
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[2006 Copiapo Chile Seismic Swarm Analysis: Mapping the Interplate Contact](#)

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AThe last best documented historical large earthquakes in the Copiapo region (27°S) occurred on 1819, Mw=8.3 and 1922, Mw=8.5. The 1983, Mw=7.4 earthquake ruptured the northern segment of the 1922 large earthquake, stopping its rupture in the same region where the 1973 seismic swarm happens. By the end of April, 2006 four thrust events with magnitudes Mw~6 started another seismic swarm activity located in the same region where the 1973 swarm was observed. The aim of this work is to analyze the 2006 swarm activity and its probable correlation with heterogeneities determined along the interplate contact. The distribution of the 2006 swarm events is located at about 30 km distance from the trench, with depth varying between 0 and 20 km. On 1998, an inland and off-shore temporary seismological network was deployed in the study region; with the obtained high resolution bathymetry it was possible to identify the trace of subducted seamounts. With the dense distribution of seismic stations and the high level of microseismicity recorded, it was obtained a 3D body wave velocity model for the region, and considering that the Wadati-Benioff zone was well identified, we plot the Vp and the Vp/Vs ratio along the interplate contact. The events associated with the 2006 swarm are well correlated with the bathymetric evidence of a subducted seamount, and with the low values of Vp and high values of Vp/Vs. Furthermore, the main anomaly associated with the body wave velocities, along the interplate contact, is also well correlated with the end of the rupture of the 1819 and 1922 large earthquakes. Through this methodology, the interplate contact can be mapped and the characterization of the heterogeneities in the coupled zone could be correlated with the rupture process of future large earthquakes along the Chilean margin. By this way, an improvement of the seismic hazard determination in Chile can be obtained.

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