



SINT-2: Sismotectónica, el ciclo de terremotos y paleosismología a lo largo del margen chileno

Assessing giant tsunamigenic megathrust earthquakes in the Northern Chile Seismic Gap from submarine and archaeological records

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Coastal and marine records along the hyperarid Atacama Desert provide a new view about the occurrence of large subduction earthquakes in the Central Andes. From high-resolution geochronology of laminated series accumulated on a narrow shelf, we associate anomalous structures such as slumps and discontinuities -overlaid by turbidites or density current deposits-, to the last giant 1877 Mw~8.8 tsunamigenic earthquake. Once compared with the reanalysis of historical chronicles and seismological data, we suggest that large magnitude events produce destabilisation at the sea bottom capable to generate slumping or discontinuities. From the ongoing analysis of marine records coupled with observations from coastal archaeological sites, we assess the occurrence of several giant tsunamigenic earthquakes in the last millennia, suggesting that the predecessor of the 1877 episode occurred close to 1409-1450 CE, as previously reported from the analysis of this same sedimentary record (Vargas et al., 2005). Results from ongoing analyses from archaeological coastal sites are providing additional key information about the impact of this kind of giant tsunamis on this hyperarid coast, as well as on the early inhabitants. From radiocarbon dating, we preliminary dated those predecessors close to 1409-1450 CE, ca. 953 CE and ca. 655 CE, with a possible event also close to 1046 CE. Under this scope, the last Mw~8 earthquakes occurred on 2014 and 2007 along this seismic gap region, seem to be moderate episodes into a larger seismic cycle.