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

**Holocene slip along the coastal El Yolki Fault in central Chile and its possible link with megathrust earthquakes**

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Great megathrust earthquakes are commonly accompanied by increased upper-plate seismicity and occasionally triggered earthquakes on shallow crustal faults. Such triggering occurred 11 days after the 2010 Maule Chile earthquake (M8.8) when a pair of M6.9 and M7 earthquake were generated by the Pichilemu Fault. At that time, the Pichilemu fault had not been previously mapped or characterized as an active fault. Despite their high magnitude, these two earthquakes were not accompanied by surface ruptures and left no imprint in the geologic record. This emphasizes the challenge of assessing the hazard posed by such crustal forearc faults. Here we studied the El Yolki Fault (EYOF), a transtensional structure midway the Maule earthquake rupture zone and located ~100 km south of Pichilemu. The EYOF was not suitably-oriented for triggered slip during the event. Using airborne LiDAR data, we mapped a deformed Holocene coastal plain back-tilted on the footwall of the EYOF. A sequence of wetland sediments, dated in outcrops and paleoseismic trenches on the footwall to 4.3-2.2 cal ka BP was uplifted ~8 m. Dislocation models require a subvertical shallow fault slipping at ~5 mm/yr to reproduce the steep back-tilt; we interpret this fault as a superficial splay of a negative flower structure associated with transtensional deformation along a deeper main branch. The mid-Holocene wetland sequence onlaps to a sequence of four erosive steps, which we interpret as a staircase sequence of wave-cut landforms formed by discrete pulses of relative sea-level drop. We associated these pulses with coseismic uplift during a cluster of crustal earthquakes along the ELYO shortly before ~4.3 ka. If EYOF earthquakes were triggered by megathrust earthquakes, their slip distribution must have been significantly different from that of the Maule earthquake. Our study highlights the variability in crustal fault slip at millennial timescale and their possible relation to megathrust earthquakes. This study has been supported by *Iniciativa Científica Milenio* (ICM) through grant NC160025 'Millennium Nucleus CYCLO: The Seismic Cycle along Subduction Zones'.