



Structural and geological analysis of the northern Pescadero basin, Gulf of California: preliminary results based on the analysis of 2D multichannel seismic reflection profiles

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The Pacific-North America plate boundary along the Gulf of California is characterized by an array of right-stepping, right-lateral, transform faults connecting a series of pull-apart basins distributed along the gulf axis. Altogether, these structures accommodate an oblique-divergent component of deformation characterizing the modern tectonic regime along the gulf. The northern Pescadero complex, in the southern Gulf of California, is one of the deepest and probably least studied transtensional fault-termination basins in the gulf. The complex is bounded to the north and south by Atl and Farallon transform faults, respectively, and consists of two asymmetric, rhomboidal-shaped, basins with a series of intrabasinal high-angle normal faults and ramps connecting their depocenters. In this study we present preliminary results derived from the processing and analysis of ~400 km of seismic reflection profiles, collected in 2006 onboard the R/V Francisco de Ulloa in northern Pescadero, providing new insights into the geology and internal structure of the basin. Northern Pescadero is a deep and narrow basin characterized by a maximum sedimentary infill of ~1 km, and depths to the basin floor exceeding 3500 m. Deformation is chiefly accommodated by an array of self-parallel half-graben structures that appear to grow towards the northern flank of the basin. Faults-scarps located farther from the deformation axis appear to be more degraded, suggesting a progressively younger age of the half-grabens near the basin's depocenter. Another important feature revealed in the seismic images is the lack of sediments on top of the crystalline basement that floors the narrow central portion of the basin. In this area the reflectors at the basin's floor show a pronounced increase in amplitude and coherence, indicating the emplacement of magmatic extrusions. Likewise, in those areas with the greater sediment infill, the occurrence of high-amplitude reflectors, located ~150 m below the seabed, and measuring several hundred of meters wide, suggests the presence of concordant saucer-shape intrusions (sills). These first order observations suggest that the northern Pescadero basin has evolved to develop a central trough floored by oceanic crust currently emplaced along a short and narrow (~2.5 km wide) spreading ridge.