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Quaternary shortening in the central Puna Plateau of NW Argentina: Preliminary results from the Salar de Pocitos, Salta province (24.5° S, 67° W)

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Active tectonism in Cenozoic orogenic plateaus is often characterized by a combination of active extensional and strike-slip faulting subsequent to protracted phases of shortening and the build-up of high topography. In the Puna Plateau of NW Argentina, the southern part of the world's second largest orogenic plateau, the changeover from shortening to extensional tectonics is thought to have occured between 7 and 5 Ma along the southeastern plateau margin, while the central and northern plateau areas apparently changed into an extensional regime between 9 and 6 Ma (Cladouhos et al., 1994). Despite these observations of extensional structures we report on new data from the Salar de Pocitos that show sustained shortening in the south-central part of the plateau.

The south-central Puna Plateau is characterized by an average elevation of about 3700 m with low relief and internally drained basins, which are bordered by reverse-fault bounded ranges. The N-S oriented Salar de Pocitos is an integral part of these contractional structures and covers an area of $\sim$435 km^2. The western border of the basin constitutes the eastern flank of an anticline involving Tertiary and Quaternary sediments, while the eastern border is delimited by a N-S striking reverse fault, bounding the range front of the Sierra Qda. Honda. In the north of the Salar de Pocitos the three Miocene volcanoes Tultul, Delmedio and Pocitos form a barrier with the Salar del Rincón, and the south of the basin is bordered by fault blocks involving Ordovician lithologies that have left only a narrow valley that may have provided an outlet of the basin in the past.

Multiple terraces generated during Late Pleistocene and Holocene lake highstands straddle the Pocitos Basin and serve as excellent strain markers to assess neotectonic deformation. We surveyed the terraces along N-S and E-W transects using a differential GPS. The E-W surveys are perpendicular to the structures that bound the basin and record differential basin-wide deformation. Although it is not possible yet to develop a reliable terrace chronology, taken together, the western terraces are higher than possibly equivalent terraces in the east, suggesting ongoing tilting related to protracted folding of the anticline in the west. In addition, orientations of faults, joints and tilted deposits were measured and analyzed. We show (preliminary) results and interpretations of these measurements. Tilted volcanic ash and sediment deposits have different dips and it appears that a distinct deformation stage is related to the regional anticline west of the Salar. A tectonic joint system and various small reverse faults also indicate active shortening in the area of the Salar de Pocitos from the Tertiary to the present-day.

Reference:

Cladouhos, T.T.; Allmendinger, R.W.; Coira, B. and Farrar, E. (1994): Late Cenozoic deformation in the Central Andes: fault kinematics from the northern Puna, northwestern Argentina and southwestern Bolivia (Journal of South American Earth Sciences, Vol. 7, No. 2., pp. 209-228)