

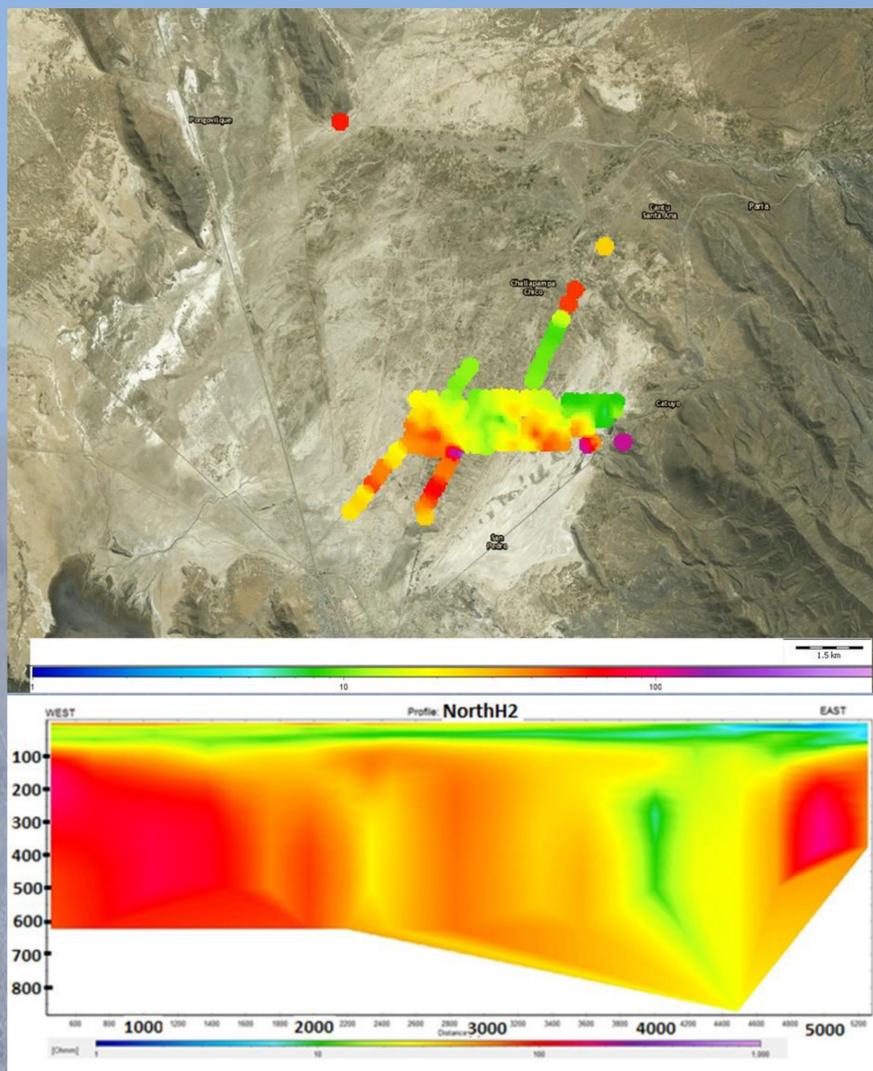
TEM investigation on Challapampa aquifer, Oruro Bolivia

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The objective of this study was to map the bottom limitation of the Challapampa aquifer that is located adjacent to the city Oruro on the Bolivian altiplano. The aquifer is mainly situated in Quaternary sediments within an alluvial fan. The surrounding bedrock consist of shale's, sandstone and intrusive rock. It is expected to find bedrock as the bottom limitation of the aquifer and structures similar to those in the surrounding mountains.

The method used to map the aquifer was a Transient Electromagnetic Method (TEM). TEM is a geophysical technique that uses transient electromagnetic (EM) waves to penetrate the ground. The method is point based, meaning that different investigation designs can be used for different purposes. In general the method has a high depth penetration with good resolution, but is varying a lot with different geologies.

The results consist of horizontal maps that present an average resistivity for a depth interval and profiles presenting the resistivity data as a cross-section profiles. The resistivity data is presented on a logarithmic color scale where blue represent the lowest values and purple the highest values. Higher value on greater depth is linked to dry bedrock while lower values closer to the surface is linked to water saturated sediments.



The study area is located 15 km northeast from Oruro city in Bolivia, South America. The area is bounded by latitudes 17°35'–18°00' S and longitudes 66°59'–67°12' W. The topography in the study area is flat, plateau-like, with an average elevation of 3 700 m a.s.l. The surrounding landscape is mountainous, with peaks reaching 4 700 m a.s.l. and characterized by a semiarid climate throughout the plateau and in the surrounding mountains. The vegetation is scarce or almost non-existent due to the semi-arid climate and the high elevation. The mean annual temperature is about 10°C and shows large differences between day and night. The rainfall is in the range of 300 to 500 mm/y, with a markedly wet summer from December to March, and dry winter from June to August. Quaternary sediments hold most groundwater in the area and are part of the Oruro-Caracollo hydrologic catchment, forming the Challapampa aquifer.

