Geophysical mapping of aquifers in Bolivia

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The project deals with geophysical mapping of the Challapampa and Punata aquifers in Bolivia. In both cases the aquifers are poorly documented in terms of geometry and variation in aquifer properties, which is key information for adequate management and protection of the water resources. The aquifers are essential for the water supply of the local communities and agriculture in the respective areas, serving populations of 300 - 400 thousand people. Both are however under threat of over exploitation as witnessed by decreasing groundwater levels, and as a consequence conflicts arise between local water supply companies serving urbanized areas and agricultural interests. There are furthermore threats to the groundwater quality from contamination such as mining and industrial activities, road transports, latrines, pesticides and fertilizers. Information about the extent of the aquifer and existence of possible protective layers with sufficient areal cover and spatial resolution is needed in order to manage and protect the groundwater for use of future generations. Local water supply and environment authorities are working in the respective areas but do not have the tools required for a comprehensive overall picture of the aquifer systems.

The aim of this project is to combine acquisition of such key information with training of students on different levels and knowledge transfer to local authorities. A specific objective is to contribute towards a better understanding of the aquifer systems in order to found a base for developing management plans to avoid over exploitation and contamination. Another objective is to train Bolivian and Scandinavian students on PhD, MSc and BSc level. A further objective is to transfer knowledge of integrated geophysical aquifer mapping to local authorities within the groundwater and environmental sector. ERT (Electrical Resistivity Tomography) and TEM (Transient ElectroMagnetic sounding) are the key methods used.