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Long term vegetation dynamics in the catchment of the shrinking Lake Poopó

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Straddling the countries of Perú and Bolivia, the Andean Altiplano is a high elevation plateau, enclosed by two branches of the Andean Mountain range. Two large lakes are located in the Altiplano: Lake Titicaca, in the Northwest and Lake Poopó, in the Southeast.

Lake Titicaca overflows into the Desaguadero River, which ends in Lake Poopó. The latter is an endorehic shallow lake, receiving approximately 65% of its inputs from the Desaguadero River. For decades, the extent of Lake Poopó closely mimicked the catchment precipitation patterns. However, in the last decade, the lake has experienced an unprecedented rapid shrinkage, defying the previously observed correlation with precipitation.

Several factors have been postulated as possible causes for the lake reduction: the Andean glaciers melting, the droughts induced by El Niño event, the diversion of water for mining and agriculture, etc.

This study used MODIS imagery to reconstruct the land use and vegetation dynamics in the Lake Poopó catchment for the last 15 years. No annual change was observed in the vegetation greenness during the dry season. However, a clear increasing trend in the vegetation indices and evapotranspiration values was measured over agricultural areas in catchment. The impact of increased evapotranspiration losses on the lake extent is currently being investigated.