



## **The relevance of mechanisms forced by mountain orography for the desiccation of Lake Urmia (NW-Iran)**

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Urmia Lake is the World's second largest saline lake and the greatest lake in Iran. Its basin is an important agricultural region for a population of around 6 million people and for even more (rough estimate of 75 million) as basic food resource. Dramatic disappearance of the lake has been observed over the last two decades, which evoked multiple discussions whether or not this is an effect of ongoing climate change or have been forced by human activities, such as water management (e.g. water dams and unapproved wells) or agriculture. The decline of the lake's water level and surface area over the last two decades has also caused an environmental disaster from increased salinity and has had negative effects on ecosystems, agriculture, livelihoods, and health. Interestingly, most recent data from the lake development over the last five years show that the decline of the lake reversed and that the lake area recovered from 500km<sup>2</sup> (when it was the worst in 2013) to about 2500km<sup>2</sup> today. It is, however, unclear to what extent either natural changes (climate, hydrology) or water management activities forced this recent development. Previous studies focused predominately on modelling efforts using scenario data from climate model simulations to drive hydrological models for assessing the impact of climate change on lake development. However, this study focusses on mechanisms effecting the lake evolution with a particular weight on mechanisms relevant for mountain regions (e.g. interaction of weather patterns with mountain orography and the snow cover) and associated effects on stream flow and droughts. This approach is motivated by the high percentage (ca. 65%) of mountains as part of the Urmia catchment and consequently goes clearly beyond previous studies. Thus it should help to better quantify the impact of climate change on the inflow to the lake and in particular to understand the recent recovering of the lake (and put it into the context of changes coming from recent water management actions, reported from other studies).