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# MODELING LAKE TITICACA'S DAILY AND MONTHLY EVAPORATION

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**Lake Titicaca is a crucial water resource in the central part of the Andean Mountain range, which is one of the lakes most affected by climate warming. Since surface evaporation explains most of the lake´s water losses, reliable estimates are paramount for the prediction of global warming impacts on Lake Titicaca and for the region´s water resources planning and adaptation to climate change. Evaporation estimates were done in the past at monthly time steps and using the four methods as follows: water balance, heat balance and mass transfer and Penman´s equation. The obtained annual evaporation values showed significant dispersion. This study used new, daily frequency hydro-meteorological measurements. Evaporation losses were calculated following the mentioned methods using both, daily records and their monthly averages, to assess the impact of higher temporal resolution data in the evaporation estimates. Changes in the lake heat storage needed for the heat balance method were estimated based on the morning water surface temperature, because convection during nights results in a well-mixed top layer every morning over a constant temperature depth. We found that the most reliable method for determining the annual lake evaporation was the heat balance approach, although the Penman equation allows an easier implementation based on generally available meteorological parameters. The mean annual lake evaporation was found to be 1700 mm year-1. This value is considered as an upper limit of the annual evaporation since the main study period was abnormally warm. The obtained upper limit lowers by 200 mm year-1, the highest evaporation estimation obtained previously, thus reducing the uncertainty in the actual value. Using daily and monthly averages resulted in minor differences for all methodologies of the evaporation estimates.**

## Biography

Ramiro Pillco-Zolá has completed his PhD at the age of 36 years from Lund University, Sweden in hydrology and post-doctoral studies from Lund University in water and sustainable development. He is researcher at Institute of Hydraulics and Hydrology in Bolivia and at Division of Water Resources Engineering in Lund University. He has published 12 in reputed journals'.

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