



Estimating areal rainfall in the Lake Victoria basin in East Africa using ground based and satellite data

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The goal of this study was to improve the understanding of the variability of rainfall in the Lake Victoria basin. The main objective was to use the available rain gauge data in the basin to derive a spatially detailed gridded rainfall dataset for the lake and its basin using geostatistical techniques. Such a dataset is very useful for water balance and other studies. A monthly rainfall dataset with 360 stations was used. Universal Kriging was used for the study and comparisons made with Inverse Distance Weighting. The size of the regular grids was 2000m with a discretisation of 100 points per block giving a support size of 200m. A key question that had to be addressed was related to the representation of lake rainfall given the lack of reliable long term measurements on the lake surface. We approached this by considering 3 different satellite products namely PERSIANN, TRMM and CMORPH, which have been shown to produce acceptable estimates for the region, and using the derived correlations with our dataset to adjust the lake rainfall estimates. Finally, we produced time series of areal mean rainfall for the main tributaries into the Lake Victoria basin including their uncertainty estimates. The results showed an enhancement of rainfall over the lake surface. The rainfall gradient falls sharply as one moves away from the lake shore before rising again in the highland areas to the east and west of the basin. Apart from the north-eastern part of the basin, there are no significant correlations between annual rainfall and either elevation or distance from the lake shore.