Modelling Catchment Rainfall Using Sum of Correlated Gamma Variables

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ABSTRACT
One of the major difficulties in simulating rainfall is the need to accurately represent rainfall
accumulations. An accurate simulation of monthly rainfall should also provide an accurate simulation
of yearly rainfall by summing the monthly totals. A major problem in this regard is that rainfall
distributions for successive months may not be independent. Thus the rainfall accumulation problem
must be represented as the summation of dependent random variables. This study is aimed to show
if the statistical parameters for several stations within a particular catchment is known, then a
weighted sum is used to determine a rainfall model for the entire local catchment. A spatial analysis
for the sum of rainfall volumes from four selected meteorological stations within the same region
using the monthly rainfall data is conducted. The sum of n correlated gamma variables is used to
model the sum of monthly rainfall totals
from four stations when there is significant correlation between the stations.