

ESTIMATION OF AVERAGE STREAM DISCHARGE  
UTILIZING MULTIVARIATE TECHNIQUES

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## ABSTRACT

The USGS groups drainage basins into hydrologic areas as a preliminary step to estimating stream discharge. It was hypothesized that stream discharge estimates could be improved if the grouping procedure was more objectively derived. Cluster analysis and discriminant analysis techniques were applied to average stream discharge estimates for sixty-three Red River of the North drainage basins to test this contention. After the grouping was completed, estimates of stream discharge were made through regression analysis. A Wilcoxon matched pairs test confirmed that there was significantly lower residual error from the analysis based upon the quantitative grouping techniques than from the USGS method.