



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2003DC40B

Title: Analysis of Positive, Right Skewed, and Unimodal Observations

Project Type: Research

Focus Categories: Education, Water Quality, Methods

Keywords: Transformation, Environmental Statistics, Skewed Distribution

Start Date: 03/01/2003

End Date: 02/28/2004

Federal Funds: \$7303.00

Matching Funds: \$14616.00

Congressional District: District of Columbia

Principal Investigators: Modarres, Dr. Reza (George Washington University)

Abstract: This research will use non-parametric or semi-parametric estimator of the mean of a positive, right skewed and unimodal distribution to develop statistical methodology of environmental data. Due to skewness, the sample mean underestimates the population mean. Such consistent underestimation of the mean has far-reaching environmental repercussion as underestimation of means tantamount to underestimation of risk. Conservative estimates of the upper quantiles are often used in regulatory settings to reflect a degree of prudence in the decision making process. This is especially true when the issues involved concern human health or protection of natural resources. We are interested in estimating the quantiles of right-skewed distribution of data by seeking symmetrizing transformation. Parameters of interest are estimated on the transformed scale and estimates of quantile are obtained on the original scale after a re-transformation. This project will better allow us to understand the relationship between symmetry and right skewness of the underlying distribution as well as train a graduate student in conducting research in statistical methodology.

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Last Modified: Wed May 28, 2003 4:26 PM

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