

## **SPATIAL INTERPOLATION OF RAINFALL DATA IN KARNATAKA USING GIS**

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### **ABSTRACT**

Spatial interpolation of rain gauge data is important in hydrological simulation and weather prediction. Reliable prediction of quantity and rate of rainfall is difficult and time consuming. Traditional models for estimation of unknown point require considerable hydrological and meteorological data collection of these data and generating of isohyets is expensive and time consuming. But, GIS can quickly generate map with isolines that indicate the average rainfall of rain gauge stations from test points. Such map can be thought of as a average rainfall counter map. Many sophisticated methods can estimate the characteristics of surfaces from a limited number of point measurements. Two and three dimensional counter maps can be generated from sample maps of rainfall in GIS environment.

Spatial interpolation uses the points with known values to estimate values at other unknown points. Spatial interpolation allows us to estimate the precipitation value at a location with no recorded data by using known precipitation readings at nearby weather stations. In GIS applications spatial interpolation is typically applied to raster data from sample points so that the surface can be used for analyses and modeling.

In the present analysis the annual rainfall at 175 rain gauge stations in Karnataka for a period of 50 years (1941-199) is collected and fed on the base map of Karnataka. The rain gauge stations are located with respect to their longitudes and latitudes using Arc GIS software. The data from excel sheet transformed into DBF and shape files with the help of geostatistical analyst tool extension. Using ArcGIS menu isohyets are generated by: Inverse Distance Weighted (IDW) method, regularized spline, tension spline, ordinary kriging & universal Kriging. The comparison of the methods is validated by isohyetal area and statistical measures like mean, Standard RMS & RMS.