

GEOSTATISTICAL ANALYSIS AS A TOOL FOR ENVIRONMENTAL MANAGEMENT AND GIS INTERFACE: SOME APPLICATIONS ON WASTE DUMPING

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For waste dumping concern the knowledge of the piezometric surface is extremely important to minimize the risk of aquifer contamination. In such case Geostatistics is a tool that allows the generation of images that can be implemented in GISs providing decision support in environmental management. From altimetric and water level data of 233 tubular wells of the Metropolitan Area of Campinas (São Paulo State, Brazil), supplied by DAEE and IG, were studied altimetric and static water-level quota and water-level depth variables. In this study it was used basic statistical analysis and Trend Surface Analysis (polynomial regression) (a deterministic and global model, that provides trends, associated, in this case, to geomorphological effects). It was applied also Geostatistics (a probabilistic and local model) analysis, although the exploratory analysis presented a non-stationary phenomenon, because the option of an Ordinary Kriging technique with a small search ellipse, respecting anisotropic ratio between range values. The choice of the variographic model can generate false structures in the final map, needing a carefully cross-validation analysis. The interpolated map can be implemented easily in GIS platforms being added to the approaches for waste deposits location, allowing the use of the map of variances as risk associated to the interpolated value. By this way the Indicator Kriging supplies a map of probability of events occurrence (in this case, the probability of points with depths higher than 20 meters), that has a more directly application. Geostatistics, integrated to GISs analysis, so become a powerful tool for Environmental Management.