Contribution to the study of spatial rainfall distribution in the central area of northern Algeria

As one of the most available parameters in hydrological modeling (example of deterministic models for flood forecasting), precipitation must be known with optimal precision at any point of space.

Putting the spatial rainfall distribution into evidence requires the use of appropriate cartographic methods. The cartographic analysis tool used in our case is a combination of the P.C.A and geostatistics.

This work lies in a contribution to the study of the spatial rainfall distribution in the center area of Northern Algeria.

P.C.A for the longest and reliable raw data allowed bringing out two regional vectors representing the most likely rainfall trend of the region considered. These vectors aim at defining a regional fictitious station typical of all stations of field study, which can therefore be used as base station (reference) for homogeneity and individual inspection of the stations: critic and expansion of the data observed.

We also assessed, from the two regional vectors, other mappable parameters to follow-up the information given by the mean annual rains. The acquisition of up-to-date data could not be in a sufficient goal in itself. In actual fact, the objective of our mapping was to take into account all available information, i.e. not only this patchy spatial knowledge, but also the topography that influences them noticeably. To do so, we tried to find the best models of the rain-relief relationship by multiple regression and we brought out some morphometric parameters that may explain the different mappable parameters. These models allow us to know the rain values at any point in space.

Reflecting the allocation structure of the known digital numbers, variogram of the residual variances showed a clear geographic pattern. Kriging allows calibrating the defined variogram parameters and interpolating ,afterwards, between the pluviometric stations so as to map the different rainfall depths of our study area.