EMS Annual Meeting Abstracts,
Vol. 6, EMS2009-555, 2009
9th EMS / 9th ECAM

9th EMS Annual Meeting
9th European Conference on Applications of Meteorology
High resolution meteorology
- applications and services

Using GIS geostatistical techniques to study the temporal and spatial rainfall characteristics in Romania

A. T. Nertan (1), V. Panaitescu (2), and Gh. Stancalie ()

(1) National Meteorological Administration, Remote Sensing&GIS Laboratory, Bucharest, Romania, gheorghe.stancalie@meteoromania.ro, (2) Polytechnics University of Bucharest, Power Engineering Faculty, Bucharest, Romania, valeriu.panaitescu@yahoo.com

Floods are among the most devastating natural hazards in the world, claiming more lives and causing more property damage than any other natural phenomena. In the last 15 years floods and accompanying landslides, occurred quit frequently in Romania, some of which isolated, others-affecting wide areas of the country's territory. When rainfall have significant spatial variation, complete rainfall data for each region with different rainfall characteristics are very important. This study aimed at using GIS statistical interpolation techniques to study the temporal and spatial rainfall characteristics and map the spatiotemporal variation in rainfall in Romania. Two geostatistical interpolation methods were compared for this research work: Inverse Distance Weighting (IDW) method and Ordinary Kriging as the stochastic methods. The two different spatial interpolation methods are applied to estimate the missing value on the basis of the remaining observed ones. The results from this study demonstrate the usefulness of the GIS techniques in assessing rainfall variability.
The paper describes also the application software based on GIS technology to create automatically the map representing the distribution of the total precipitation amounts for intervals of interest (i.e. monthly, annual, for critical vegetation periods, seasonal, for agricultural years, etc). The application accesses automatically the corresponding database and offers the possibility to save and keep these maps in different format (JPEG, PDF) files which can be sent to the decision-making factors in order to carry out strategic decisions proper to each situation. It also offers to the users the possibility to interrogate databases, create graphs to analyze the temporal evolution of the selected meteorological parameter.