

Possibility of dew use and better utilization in the Serbia

Aleksandar Valjarevic (1) and Dragica Živković (2)

(1) University of Kosovska Mitrovica, Geography, Faculty of Natural Science and Mathematics, Department of Geography, Ive Lole Ribara 29, Kosovska Mitrovica, Serbia (aleksandar.valjarevic@pr.ac.rs), (2) University of Belgrade, Faculty of Geography, Studentski Trg 3/III, Belgrade, Serbia, dragicanbgd@gmail.com

The Republic of Serbia has an area of 88,361 km², but the need for drinking water grows every year. Serbia has, for the time being, waters from the biggest rivers systems and lakes. According to climate change, Serbia may stay without drinking water in some mountains and plains. Especially, the north part of the country is more vulnerable. With the help of satellite data and numerical GIS methods, we estimated total capacity of dew volume at the whole territory. Multi-criteria GIS analysis and satellite detections with methods such as kriging and semi-kriging gave satisfactory results of this research. Ordinary kriging method was employed through QGIS and SAGA (GIS) of Spatial Analyst. Although there are a few other methods, the priority is given to ordinary kriging and Global kriging because it includes autocorrelation or the statistical relationship among the measured points. Thus, with this method, the weights are based not only on the distance between the measured points and the prediction of location but also on the overall spatial arrangement of the measured points and it minimizes the variance of the error of estimation. When we downloaded satellite data, these data were compared with meteorological data of precipitation, evaporation and temperature. All results were presented on the maps of dew distribution across the country. We got very precise grid in 1x10 of longitude and latitude. Also we derived relief of dew distribution according to the estimation of elevation. These maps could be interpreted and implemented in new projects for better utilization of dew use in Serbia. The advantages of this approach are in the application of three dimension analysis. The estimated total capacity of dew potential of Serbia is 10000 cubic kilometer or 10x10¹⁶ liters. Comparing the obtained data for Serbia this type of water is not large but it is enough for farming or using of drinking water in semi-arid and arid areas. This type of water will be more used in Serbia according to climate change effects and drought influence.

Key words: Serbia, dew capacity, GIS analysis, Satellite detection, Maps