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APPLICATION OF GIS IN MODELING ZILBERCHAI BASIN RUNOFF

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Abstract. Runoff is one of most important hydrological variables that are used in many civil works, planning for optimal use of reservoirs, organizing rivers and warning flood. The runoff curve number (CN) is a key factor in determining runoff in the SCS (Soil Conservation Service) based hydrologic modeling method. The traditional SCS-CN method for calculating the composite curve number consumes a major portion of the hydrologic modeling time. Therefore, geographic information systems (GIS) are now being used in combination with the SCS-CN method. This work uses a methodology of determining surface runoff by Geographic Information System model and applying SCS-CN method that needs the necessary parameters such as land use map, hydrologic soil groups, rainfall data, DEM, physiographic characteristic of the basin. The model is built by implementing some well known hydrologic methods in GIS like as ArcHydro, ArcCN-Runoff for modeling of Zilberchai basin runoff. The results show that the high average weighted of curve number indicate that permeability of the basin is low and therefore likelihood of flooding is high. So the fundamental works is essential in order to increase water infiltration in Zilberchai basin and to avoid wasting surface water resources. Also comparing the results of the computed and observed runoff value show that use of GIS tools in addition to accelerate the calculation of the runoff also increase the accuracy of the results. This paper clearly demonstrates that the integration of GIS with the SCS-CN method provides a powerful tool for estimating runoff volumes in large basins.

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