Satellite-derived land covers for runoff estimation using SCS-CN method in Chen-You-Lan Watershed, Taiwan

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The Soil Conservation Service Curve Number (SCS-CN) method, which was originally developed by the USDA Natural Resources Conservation Service, is widely used to estimate direct runoff volume from rainfall. The runoff Curve Number (CN) parameter is based on the hydrologic soil group and land use factors. In Taiwan, the national land use maps were interpreted from aerial photos in 1995 and 2008. Rapid updating of post-disaster land use map is limited due to the high cost of production, so the classification of satellite images is the alternative method to obtain the land use map. In this study, Normalized Difference Vegetation Index (NDVI) in Chen-You-Lan Watershed was derived from dry and wet season of Landsat imageries during 2003 – 2008. Land covers were interpreted from mean value and standard deviation of NDVI and were categorized into 4 groups i.e. forest, grassland, agriculture and bare land. Then, the runoff volume of typhoon events during 2005 – 2009 were estimated using SCS-CN method and verified with the measured runoff data. The result showed that the model efficiency coefficient is 90.77%. Therefore, estimating runoff by using the land cover map classified from satellite images is practicable.