

Predicting Flood Vulnerable Areas by Using Remote Sensing Images in Kumamoto City – Japan

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Flood is a natural disaster that occurs almost every year in Japan. Based on the flood record, it occurs during the rainy season around July each year. The aim of this research is to predict areas vulnerable to flood. The current research location is the Shiragawa watershed. This study was carried out using DEMs data, ALOS AVNIR-2, Landsat 7 ETM+ and Amedas data to produce watershed area, vegetation index, land cover map, soil moisture map and isohyet. DEM data with spatial resolution of 10 meters was derived from the Geospatial Information Authority of Japan (GSI) in order to show the watershed. The AVNIR-2 imagery was used to create the land cover map and the vegetation index, and the soil moisture data was derived from Landsat 7 ETM+ imagery by applying red and infrared bands using the least-squares regression. The land cover map was created by unsupervised method then verified by using land cover map of the Geospatial Information Authority of Japan (GSI). Vegetation index was created by using Normalize Vegetation Index (NDVI) algorithm. The isohyet was obtained using data from rain gauges stationed in Kumamoto Prefecture then interpolating by applying the *kriging* method. All spatial data was overlaid to create a runoff map. This study combines all the data to predict vulnerable areas. These results are compared to the flood historical data in Kumamoto City. The results indicate that soil moisture does not have a great impact on flooding because the rainfall does not infiltrate to the ground water, but instead becomes surface runoff.

Keywords : Flood, satellite imagery, GSI, surface runoff, Kumamoto city.