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Assessment of flood Response Characteristics to Urbanization and extreme flood events-Typhoons at Cheongju, Chungbuk

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The changes of land use influence on the flood characteristics, which depend on rainfall runoff procedures in the catchment. This study assesses the changes of flood characteristics due to land use changes between 1997 and 2012. The catchment model (HEC-HMS) is calibrated with flood events of 1990‘s and 2000’s respectively, then the design rainfall of 100, 200, 500year return period are applied to this model, which represent the catchment in 1990‘s and 2000’s, to assess the flood peaks. Then the extreme flood events (i.e. 6 typhoon events) are applied to assess the flood responses.
The results of comparison between 1990‘s and 2000’s show that the flood peak and level of 2000’s are increasing and time to peak of 2000’s is decreasing comparing to those of 1990’s :3% to 78% increase in flood peak, 3% in flood level and 10.2% to 16% decrease in time to peak in 100year return period flood. It is due to decreasing of the farmland area (2.18%), mountainous area (8.88%), and increasing of the urbanization of the area (5.86%).
This study also estimates the responses to extreme flood events. The results of 2000’s show that the increasing of the flood peak and time to peak comparing to 1990’s. It indicates that the extreme rainfall is more responsible at unurbanized catchment (2000’s), which resulting with a 11% increasing of the peak volume.

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