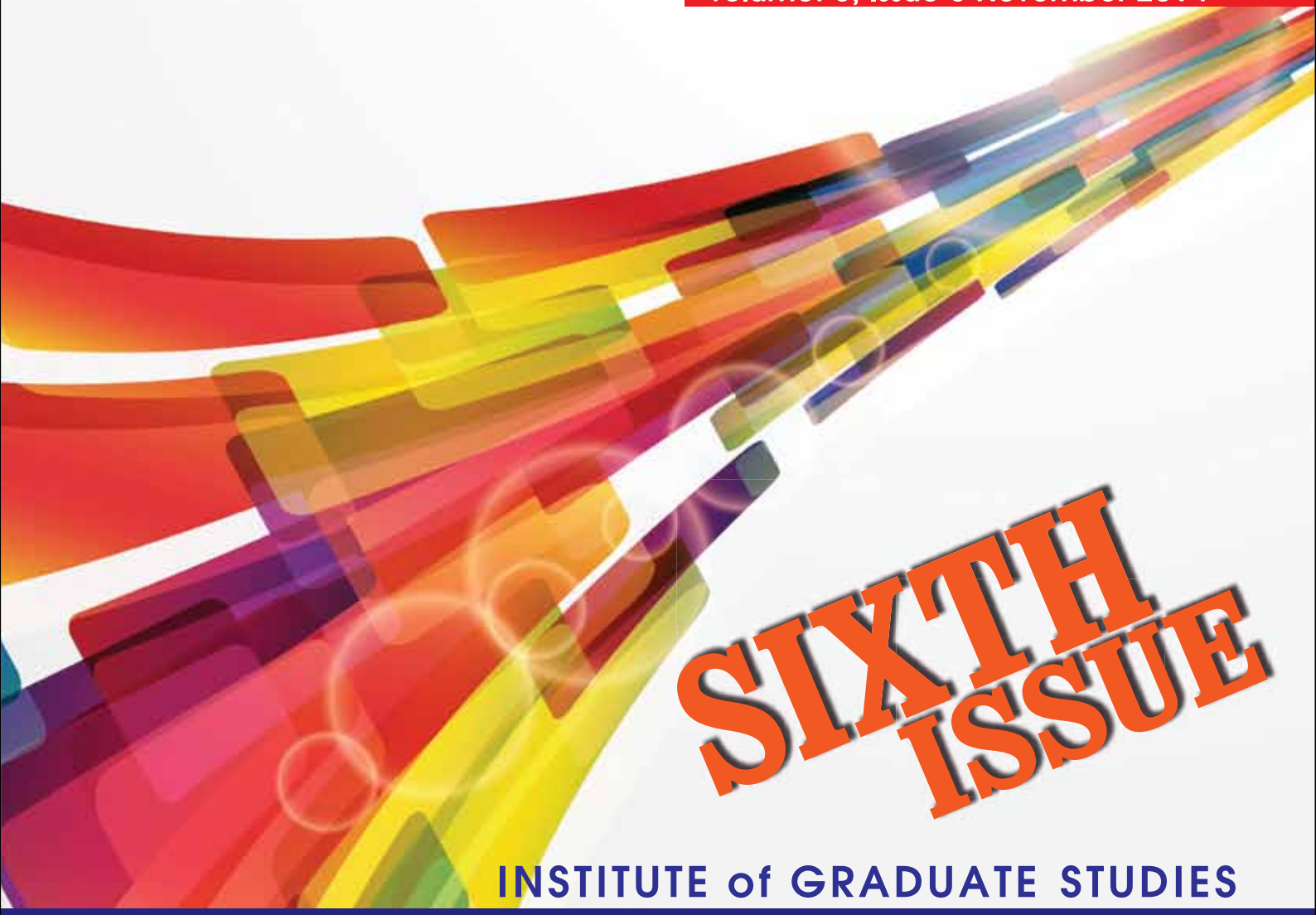
UNIVERSITI TEKNOLOGI MARA

THE DOCTORAL RESEARCH ABSTRACTS

Volume: 6, Issue 6 November 2014



SIXTH ISSUE

INSTITUTE of GRADUATE STUDIES

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Title :
Development Of Rainfall Model For Flood Level Simulation Incorporating Tidal Effects

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Flood simulation models that have been developed in these decades are mostly influenced by local factors. Building a good flood model begins with determining the amount of rainfall that is influenced by local meteorology; and this model can estimate the rainfall pattern in the next catchment area, in which the runoff will flow to the ocean. However, most of the developed models are not capable of merging the whole hydrologic cycle, where the models should incorporate rainfall models with meteorological parameters. This step is very important as to first, project the amount of rainfall in a particular catchment area, considering the overall hydrologic model and second, to identify the areas with flood risks, considering the tidal effect. In order to fix the shortcoming, this study introduces a rainfall model that has been developed using selected rainfall parameters with the aim to recognize rainfall depth in a catchment area. In order to examine its ability, the rainfall model will be integrated with selected hydrologic models after the development phase. The result will influence quantity of flood in the catchment area, if a flood simulation model that considers every factor in hydrologic cycle were to be developed. This study proposes a rainfall model that utilizes the amount of rainfall, temperature, humidity

and pressure records taken from selected stations in Peninsular Malaysia and they are analyzed using SPSS multiple regression model. The analysis shows that the selected meteorological parameters influence the rainfall development. As a result, the rainfall model developed for Senai proves that it can be used in Kota Tinggi catchment area within the limit boundaries, as the two stations are close from one another. Then, the amounts of rainfall at the Senai and Kota Tinggi stations are compared and the calibration analysis shows that the proposed rainfall model can be used in both areas. Kota Tinggi, Johor is chosen as the study area because of its flood records in 2006 and 2007. The amount of rainfall collected from selected stations in Kota Tinggi catchment has been processed using hydrologic model, HEC-HMS to identify the ability of Kota Tinggi as a catchment area in order to accommodate a huge amount of runoff that can cause flooding. During calibration process, the tests demonstrate that the simulation data and the data from previous floods are almost similar. This result suggests that the damaging floods in 2006 and 2007 were caused by Sungai Johor's incapability to accommodate the increased amount of rainfall and tidal effect at that time. In addition, flood inundation model is then developed for Kota Tinggi's catchment area, which includes Sungai Johor and the lowland areas in Kota Tinggi, using InfoWork RS and SURF7. The flood inundation model integrated with hydrologic and rainfall models produce data that resembles the data collected during flooding. In conclusion, the calibration analysis and validation for each suggested model show that the combination of rainfall, hydrologic and simulation models enhance the overall result and could be developed using selected parameters for each catchment area of interest.