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# Assessing Flood Risk and Mapping Inundation Zones in the Kelantan River Basin: A Hydrodynamic Modeling Approach

**Authors :** Fatemehsadat Mortazavizadeh, Amin Dehghani, Majid Mirzaei, Nurulhuda Binti Mohammad Ramli, Adnan Dehghani

**Abstract :** Flood is Malaysia's most common and serious natural disaster. Kelantan River Basin is a tropical basin that experiences a rainy season during North-East Monsoon from November to March. It is also one of the hardest hit areas in Peninsular Malaysia during the heavy monsoon rainfall. Considering the consequences of the flood events, it is essential to develop the flood inundation map as part of the mitigation approach. In this study, the delineation of flood inundation zone in the area of Kelantan River basin using a hydrodynamic model is done by HEC-RAS, QGIS and ArcMap. The streamflow data has been generated with the weather generator based on the observation data. Then, the data is statistically analyzed with the Extreme Value (EV1) method for 2-, 5-, 25-, 50- and 100-year return periods. The minimum depth, maximum depth, mean depth, and the standard deviation of all the scenarios, including the OBS, are observed and analyzed. Based on the results, generally, the value of the data increases with the return period for all the scenarios. However, there are certain scenarios that have different results, which not all the data obtained are increasing with the return period. Besides, OBS data resulted in the middle range within Scenario 1 to Scenario 40.

**Keywords :** flood inundation, kelantan river basin, hydrodynamic model, extreme value analysis
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