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Development of stream classification system on tropical areas with statistical approval in Pahang River basin, Malaysia

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ABSTRACT

Stream classification system identified the characteristic of stream on the basin. Stream behaviors can provide guidance for future problem in this basin. This study discusses on the development of stream classification system on tropical areas with statistical approval based on remote sensing, geographical information system, and river hydrographic survey based on Rosgen classification system. Pahang River Basin is the longest river in Peninsular Malaysia and the main channel to drain off water from the inundated area of Pahang Basin to the South China Sea. The environmental statistical techniques were used to identify the clustering development on the tropical river system using hierarchical agglomerative cluster analysis (HACA), discriminant analysis (DA) and principal component analysis (PCA). The HACA results indicated that the main of Pahang tropical river system is classed into three main clusters namely the upstream reach, middle stream reach and downstream reach. The calibration and validation analyses proved the DA with 100% confident level. The PCA indicates three variables demonstrated significant correlations that are domination slope R^2 = 0.796, bankfull width-to-depth ratio R^2 = −0868, and sinuosity R^2 = 0.557, respectively. Model of stream classification system with future geomorphology process and problem expectations is produced where the first class considered in terrace and valley erosion zone, second class in a low terrace of land near the channels and sediment transports zone, and third class in valley deposition and floodplain zone. The results are important to local authorities as a decision support system using the river clustering model for Pahang River Basin.

Keywords: Stream classification system; Tropical areas; Pahang River Basin; Rosgen classification system; HACA

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