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MARA INSTITUTE OF TECHNOLOGY

HYDROLOGICAL DATA PROCESSING AND QUALITY CONTROL OF OBSERVATIONS ON RAINFALL AND RIVER FLOW : ERROR CALIBRATION , A CASE STUDY OF SUNGAI MUDA AT JENIANG , KEDAH .

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BY

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SYNOPSIS .

This study is to analyse the systematic compilation of data , analysis of error and calibration of data collected. Since hydrologic phenomena are mostly random in nature , their prediction cannot be done in absolute terms and hence some statistical method analysis is made to predict the frequency for any desired events or occurrences .

Data obtained from measurement gauges of rainfall and river flow must represent the actual condition of the catchment area . There are some of external factors that influence the accuracy of the data such as the process of Infiltration , Transpiration and Evaporation which produce the percentage of error that might affect the accuracy of data .

This study involves the collection of rainfall and river flow data of daily , monthly and annual basis at the particular research area chosen , for this thesis the area chosen is Sungai Muda at Jeniang , Kedah . Using some particular methods the percentage of error can be calculated . Finally , possible sources of error are evaluated , and method is proposed for predicting the magnitude of error using data that are commonly available for severe , historic rainfall .

1.0 INTRODUCTION

Extreme rainfalls results in floods that often cause damage from high levels and velocities , erosion and sediments movement and contaminant transport . Investigations of the cause and impact of extreme floods usually rely on computer simulations rather than direct field observations due to the relative infrequency of these evens .

A critical step in this approach is the calibration of the model using observed rainfall - runoff evens to set parameters values and develop estimates of potential uncertainty in the simulated hydrograph .

The most critical events for the calibration phase are the larger observed floods because catchment response to different scales of rainfall is non-linear . One of the largest sources of uncertainty in the calibration process is error in the observed rainstorm increases . Accurate measurements of observed extreme rainfalls are also important in flood forecasting .

A precipitation gauge measures the precipitation at one geographical point and cannot be representative of the precipitation on a larger area except in its immediate vicinity .

The larger the area, the greater the error in the assumption , because meteorological conditions may occasionally produce intensities at a point greater than