

Apichat Srisupun 2007 : Application of Mathematical Model for Forecasting the Discharge of Eastern Coast Basin. Master of Engineering (Water Resources Engineering), Major Field: Water Resources Engineering, Department of Water Resources Engineering. Thesis Advisor: Associate Professor Suwatana Chittaladakorn, Ph.D. 135 pages.

Eastern Coast Basin is a high-growth consumption zone due to the community and industrial expansion which causes the increasing need of water demand in the community and industrial area. The objective of this study was to evaluate daily discharge of the Eastern Coast Basin and its sub basins, and to find parameters related to the Eastern Coast Basin using the HEC-HMS mathematical model. Model input data consists of daily rainfall of 12 years period during 1990-2001 and the initial conditions. The results of the model are the excess rainfall, the daily discharge hydrograph and the amount of base flow of the channels in the study basin. For model calibration and verification, the calculated hydrograph was simulated and compared with the observed hydrographs at each particular gauging station.

The studied results showed that the values of CN, Cp, and Muskingum X of sub-basins were in the ranges of 41-77, 0.42-0.55 and 0.3-0.5, respectively. The parameters of Ia,  $t_p$  and Muskingum K were found in the ranges of 15-73 mm., 0.48-13.89 hr, and 1.3-150 hr, respectively. All parameter values are within the recommended ranges instructed by the manual of the HEC-HMS model. As the output result of the hydrograph for the main channel using above parameters, it is found that the obtained discharges by model were closed to the recorded values of annual discharge with  $R^2$  in the range of 0.8-0.93. These hydrographs can be used for future forecasting of daily discharge for the operation of reservoirs, for project planning, and for designing of hydraulic structures in this Eastern Coast Basin.



Student's signature



Thesis Advisor's signature

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