TOWARDS THE PREDICTION IN UNGAUGED BASINS -- DATABASE DEVELOPMENT FOR A MESOSCALE RIVER BASIN IN TROPIC CLIMATIC ZONE

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In general, a hydrological model applicable for PUB (Prediction in Ungauged Basins) should be capable of identifying model parameters directly on the base of basin features, and model performance is desired to be free from uncertainty resulted from scale problem. To develop and validate such models and carry out their inter-comparisons, particularly in establishing the relationship between model parameters and basin features, hydrological databases of various well-gauged study/experimental basins are essential. For a selected study basin, the accuracy of collected hydrological data has the same importance as model itself. It is desired that the stream flow discharge is not disturbed by human activities, the intensity of hydro-climatic gauge station is not too low and long-term hydro-climatic records are available. Also, corresponding to physically based distributed hydrological models, data of land use/cover, soil type, soil water content and geology are desired to be available. Moreover, such database is desired to be prepared for such representative river basins that locate in different climatic zones and have different hydrological response characteristics.For the Southeast Asia, selecting a well-gauged representative study basin for PUB is necessary, because in this area there exist many unguaged basins and their hydrological predictions are becoming more and more important to overcome the water crisis in the 21st century. In this study, prepared was the database of a mesoscale river basin that locates in tropic climatic zone, the Khlong Luang River basin of Thailand.This basin locates in the southeast of Thailand, 100 km far from Bangkok, has a drainage area of 433 km2 and a mainstream of about 30 km. Its elevation is between 30-100 m and its topography is comparatively flat. There is not large dam and large city in the basin and no significant human made interruption to the natural stream flow. Its major land use is for agriculture; about 70% of the area is arable. Its surface soil is dominantly loam and clay. From 1965 to present, the Royal Irrigation Department of Thailand (RID) has been measuring water level, discharge, rainfall, and evaporation for the Khlong Luang

River basin. The Public Works Research Institute of Japan (PWRI) and RID have carried out cooperative observation for soil moisture during 1994 to 1995. For the period of 1965-2001, the observed annual average rainfall is 1229.94 mm, the maximum and minimum are 1644.7 mm and 869.8 mm, respectively; annual runoff is 663.6-48.2 mm, and the annual runoff rate is between 43% and 5.5%. For the Khlong Luang River basin, the prepared hydrological database contains observed rainfall, stream discharge/water level, evaporation, land use, soil type, soil water content and geology. This database will open to PUB researchers who plan to apply watershed and rainfall data to a physically based distributed hydrological model and to verify the model with observed discharge data. The authors will report the analytical results using the BTOPMC (Block-wise use of TOPMODEL with Muskingum-Cunge method), for relating model parameters with physical features of the Khlong Luang River basin.