

A STUDY OF DISASTROUS FLASH FLOOD IN KHLONG U-TAPAO RIVER BASIN UTILIZING A COMBINED PHYSICAL AND MATHEMATICAL SIMULATION MODEL

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A severe flash flood, with no warning, occurred on the 21st of November 2000 in Khlong U-Tapao river basin, in the Songkhla Lake Basin in southern Thailand, and it was four days before the waters subsided. This was the second such disaster, the first occurring in 1998.

The penultimate cause of the flood, which reached 2.5-3.0 meters above the normal river bank, was a north-east monsoon rainstorm which, in one day, dropped 352-420 mm of rain. It caused a least 6 deaths, flooded over 20,000 homes, and economic losses of over 300 million US\$. In an effort to understand more fully the processes that resulted in this disaster and take appropriate action to prevent a recurrence, both physical and mathematical simulation models were utilized to devise a flood warning system, which was eventually completed and known as the Protection-Mitigation Plan for the basin.

A large quantity of hydrological data were collected for the mathematical simulation model. It was found that the most sensitive parameters were the coefficient roughness of the channel (n), weighing factor (k) and the cross-sectional areas of the flow. These were adjusted in the model to render the best fit of the flood flow hydrographs. The models gave a better understanding and increased the predictability of flood events, and showed the consequences of environmental changes resulting from human activities. Similar studies in the future can utilize the model also, as southern Thailand is recognized as a critical flood area as the result of ENSO.

