

Thesis Title	Hydrological Model for Flood Forecasting in the Upper Ping Basin	
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ABSTRACT

This research on “Hydrological Model for Flood Forecasting in the Upper Ping Basin”, uses hydrological concepts and models and applies Geographic Information Systems. Conclusions are drawn from the following research objectives. 1) The study and analysis of the physical characteristics of watershed area, climate, and hydrological study of flooding on the river banks of the upper Ping basin: the factors affecting drainage such as shape of watersheds, drainage pattern, drainage characteristics and density, the amount of rainfall, number of raining days, watershed qualification class, land use and land cover, elevation, slope and aspect are taken into consideration. The research concludes that flooding is caused by various factors including gentle slope, low level of river banks, low level of vegetable cover, proximity to the community and agricultural land and location between tributaries. The high chance of flooding occurs in the middle of May and during September to October, after an extended periods of intense raining around the low level of the Ping river bank, the mouth of Mae Rim and Mae Li streams. 2) The study of the effects of human activities on flooding along the river bank of the upper Ping basin: two types of activities affect flooding and may either increase or decrease the chance of flooding. The activities which could decrease the chance of flooding are those that decrease the critical level or increase the capacity of the water flow in the river. These include the channel dredging or the sand extracting; and also activities which control the water level in the river, such as dam construction. Activities that could increase the chance of flooding are activities

on land use that decrease the capacity of soil percolation and drainage. The control of dam's water level by evacuating water through irrigated canals can create a flooding possibility on the irrigated lands. The prevention of river bank from degradation or erosion can cause the accumulation of sediments and forming a bottle neck to the river. The construction of small check dams on the Ping river can cause flooding due to the sedimentation on the river bed.

3) The application of a hydrological model and program development using Geographic Information Systems to predict the chances of flooding on the Ping river bank in the upper Ping basin: the critical water level of the river and the channel routing are used in the mathematical model, and the volume and level of water in the river are predicted. The results indicate the risk of flooding area along the hydrological stations. This model can develop to on-line system and can apply to other basins.