

Saksee Taibpim 2014: Water-Related Disaster Analysis in Trat River Basin.
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The objective of this study was to investigate the occurrences of water related disasters, which often found in Trat river basin, under different hydrologic conditions. The study focused on two disasters, the flood problem in the rainy season and the salinity intrusion problem in the dry season. The mathematical model package MIKE 11-NAM/HD/AD was applied for simulating the occurrences of these two phenomena. At the first stage of the study the model was calibrated and verified. The rainfall-runoff model NAM was calibrated and verified by using the rainfall data from the year 2003-2009 to generate the stage hydrographs at river gaging stations Z10, Z30, Z45 and Z46. Comparison of computed water levels with observed data yielded the regression coefficient R in the range between 0.866-0.940. Calibration and verification of the hydrodynamic model HD as conducted by using the data at eight telemetering stations (TTR 01-TTR 08) which were observed from flood events in the year 2013 yielded the Manning's roughness coefficients 'n' of the river reaches between 0.017-0.095 in the main channel and 0.100-0.200 on the flood plains. Calibration and verification of the Advection-Dispersion Model (AD) for the study on salinity intrusion were done through the use of river flow data and salinity measurement data in the year 2013. The diffusion coefficient of the river was found to be in the range between 50-500 m²/s. The calibrated NAM and HD models were then applied to study flood conditions as resulted from 105 study cases. These study cases are the combinations of each of the top five maximum annual values of 1-day, 2-days, and 3-days duration rainfall averaged over the river basin with different values of tide levels at the river mouth. These tide levels were increased from -1.50 m.MSL to + 1.50 m.MSL at 0.50 m. increment. Results of the study could be applied for forecasting the flood discharges and flood levels at different locations along the river and flood maps were also produced. In the simulation of salinity intrusion problems by AD Model, the main supply of freshwater was released from Huay Raeng reservoir at 10 , 20, 30,40,50, and 60 m³/s. In all cases, the tide level and the salinity data used were those of the year 2007. It was found that the intrusion length from the river mouth where the salinity concentration at 2 gm./l could reach varied inversely with the amount of freshwater released from upstream. Their values were 14.75,13.00, 12.00,11.00, 10.50, and 9.50 respectively. The overall results of this study could be used as guidelines for developing water management plans for harnessing the water-related disasters in Trat river basin.

Student's signature

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