

The Effect of Flow Discharge on Suspended Solids Transport in the Nakhon-Nayok River

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Abstract : Suspended solid is one factor for water quality in open channel. It affects various problems in waterways that could cause high sedimentation in the channels, leading to shallowness in the river. It is composed of the organic and inorganic materials which can settle down anywhere along the open channel. Thus, depends on the solid amount and its composition, it occupies the water body capacity and causes the water quality problems simultaneously. However, the existing of suspended solid in the water column depends on the flow discharge (Q) and secchi depth (sec). This study aims to examine the effect of flow discharge (Q) and secchi depth (sec) on the suspended solids concentration in open channel and attempts to establish the formula that represents the relationship between flow discharges (Q), secchi depth (sec) and suspended solid concentration. The field samplings have been conducted in the Nakhon-Nayok river, during the wet season, September 15-16, 2014 and dry season, March 10-11, 2015. The samplings with five different locations are measured. The discharge has been measured onsite by floating technics, the secchi depth has been measured by secchi disc and the water samples have been collected at the center of the water column. They have been analyzed in the laboratory for the suspended solids concentration. The results demonstrate that the decrease in suspended solids concentration is dependent on flow discharge, since the natural processes in erosion consists of routing of eroded material. Finally, an empirical equation to compute the suspended solids concentration that shows an equation ($SS_{con} = 9.852 (\text{sec}) - 0.759 Q^{0.0355}$) is developed. The calculated suspended solids concentration, with uses of empirical formula, show good agreement with the record data as the $R^2 = 0.831$. Therefore, the empirical formula in this study is clearly verified.

Keywords : suspended solids concentration, the Nakhon-Nayok river, secchi depth, floating technics

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