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Preliminary study on sediment load at Sungai Galing, Kuantan, Pahang

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Abstract

In general, sediment comprises many shapes and sizes. The sediment size can be small, such as sand, small pebbles and silt, or large such as boulders, which are normally found upriver. Sediments found in estuaries are mostly fine-grained, such as sand and silt. The speed at which water flows in rivers plays an important part in determining its capacity to carry away sediments. Slower moving rivers will have a lower rate of sediment movement.

According to Allison, J (1995), the process of sediment deposition is also dependent on river discharge and speed of river flow. As such, a higher discharge values and water velocity would result in higher amounts of sediment. In addition, time is a factor whereby the longer the sediment deposition process, the higher the sediment loads.

Over a period of time, the high amount of sediment will settle down and the accumulated sediment will eat up the river bed thus causing the river to overflow or flooding. Thus, knowledge of the quantity, quality and dynamics of sediments is essential for managing our water resources systems and to against negative effects from happen.

A study on sediment load was conducted at the Galing River in three different days which are 28/02/13, 13/03/13 and 27/03/13. Three sampling point representing the length of Galing River which is about 7.7km has been selected: Station 1 (S1) upstream Galing River, Station 2 (S2) mid-streams Galing River and Station 3 (S3) downstream Galing River (Figure 1). Sediment samples were collected using grab sampler. Three sample replications were collected from each station and the finding was presented by the average of the replicated samples. The samples collected were analysed in the laboratory.

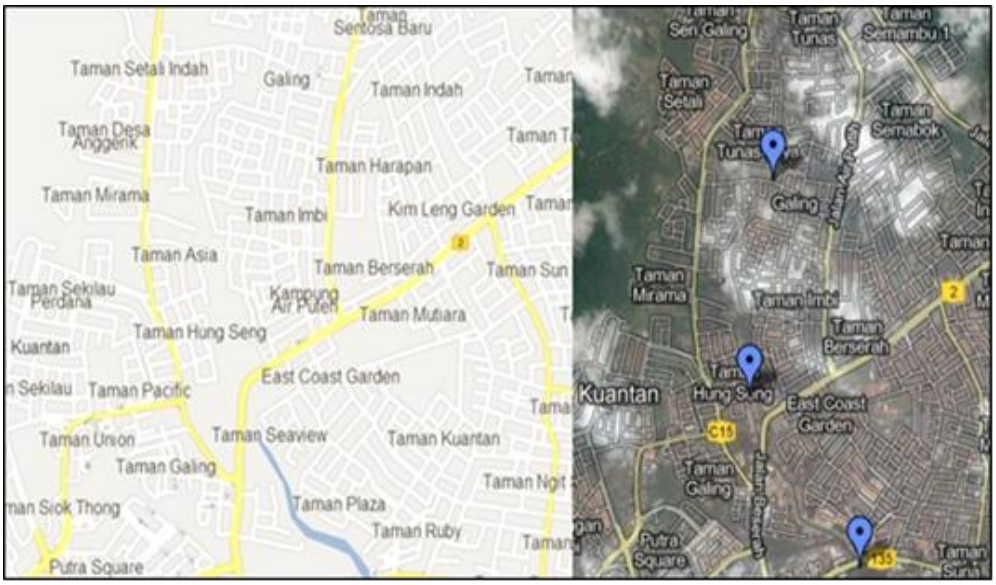

Figure 1: Location of sampling station

In this study, sediment grain size is acquired through sieve analysis. The Udden-Wentworth scale was used in this research as to identify the grain size. This scale is a geometric series in which each grade limit is twice as large as the next smaller grade limit. The scale starting at 1 mm and changing by a fixed ratio of 2 (J. A. Udden, 1898).

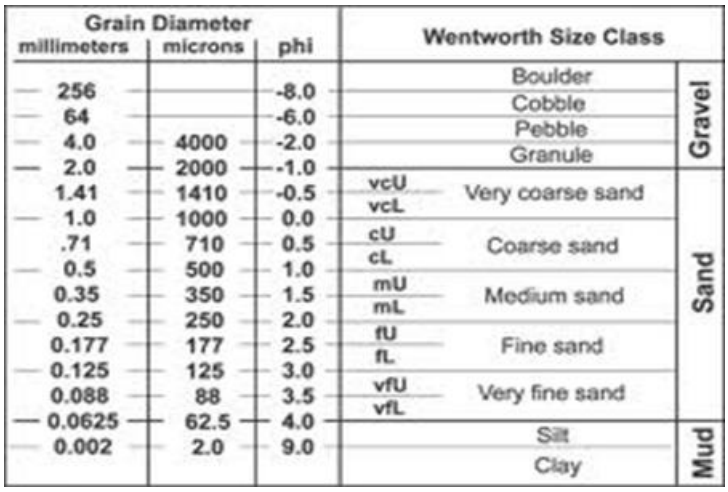

Figure 2: Udden Wenthworth phi scale

Sediment load is calculated using Engelund Hansen's formula. It is preferred to use Engelund Hansen as all samples more suitable with this formula compare to others sediment load formula. Engelund Hansen function required median size (D_{50}) larger than 0.15mm. Overall, the findings of the study show that the sizes of sediment at Galing River based on Udden-Wentworth scale fall between phi 0.5 to 0 (0.71 to 1.0 mm) which indicates coarse sand type. The values for sediment load at Station 1 were 0.012tonnes/m-day, 0.046tonnes/m-day at Station 2 and 0.034tonnes/m-day at Station 3.

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