

Study on the flow of water through non- submerged vegetation

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Abstract. Vegetation is an important feature of many rivers. Vegetation along rivers produces high resistance to flow and, as a result, has a large impact on water levels in rivers and lakes. This paper investigates the effects of instream-unsubmerged vegetation (such as the reed-similar *Kalmus*) on flow resistance and velocity distributions. Artificial vegetation is used in the experimental study to simulate the *Acorus Calmus L.* Experimental tests have shown that resistance depends strongly on vegetation density and that the Manning resistance coefficient varies with the depth of flow. A simplified model based on concepts of drag is developed to evaluate the roughness coefficient (Manning's n) for unsubmerged vegetation. In vegetated channels the overall flow resistance is influenced significantly by the distribution pattern of the vegetated beds. Within vegetation, the mean velocity decreases with flow for which the vegetative roughness increases with decreasing velocity and vertical turbulent transport of momentum is negligible as demonstrated by experiments.

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