

The Effect of Vegetation Zones on Adjacent Clear Channel Flow

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Abstract

Methods are proposed to take account of the effect of emergent vegetation (which covers only part of the channel bed) on conveyance and depth-averaged velocity in open channels. For emergent vegetation strips parallel to the flow direction, discharge can be predicted separately for each vegetated or non-vegetated zone. The equations of Kaiser (1985) and Nuding (1991, 1994) can predict the influence of the vegetation on conveyance within the non-vegetated zone via the composite roughness formula of Pavlovski (1931). In order to predict the lateral distribution of depth-averaged velocity within the non-vegetated zone, the equations of Nuding (1991, 1994) have been modified to take account of the relation between non-vegetated zone width, apparent shear stress on the vegetation interface and the maximum velocity which will occur. For more complex geometries, two-dimensional numerical hydraulic models using existing software and existing relations for the prediction of eddy viscosity are recommended.