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The Effect of Vegetation Zones on Adjacent Clear Channel Flow

by P.M. Hirschowitz

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.