

Comparison of Two Sediment Transport Formulae Used in TRIM3D

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Abstract: An extension of TRIM3D by including two more equations for advection-diffusion of suspended sand concentration and bed evolution is carried out. A combination between the characteristic method and implicit difference scheme is used to solve the former equation and second Lax-Wendroff scheme for the later one. The extended TRIM3D is applied to predict the short-term bed evolution due to erosion and deposition caused by local sediment transport in case of a supposed suspended sand source supplied by a soft bed with very high concentration near the bed. At the same time, a detailed evaluation on difference of morphological process based on two bedload transport formulae by Van Rijn and Swart is implemented. It is seen that the dynamics influence by using two formulae can be ignored when the field of current velocity is quite large, because at this time suspended sand transport is dominant in comparison with bedload transport. The computed result showed a sensibility and applicability of the model in practice.

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