

عنوان مقاله:

Erosion of channel beds covered by cohesive sediments

محل انتشار:

چهارمین کنفرانس بین المللی رفتار بلندمدت و فن آوری های نو سازی سازگار با محیط زیست سدها (سال: 1396)

تعداد صفحات اصل مقاله: 5

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خلاصه مقاله:

A physically based model is developed for estimation of surface erosion flux of cohesive bed channels. Merit of the model, with respect to well-known formulas, is application of new approaches for estimation of erosion flux coefficient and critical shear stress. This model also accounts for stochastic behavior of the actual bed shear stress. It is assumed that the erosion flux coefficient is the same as entrainment flux of fluid mud layer. The critical shear stress has also taken to be proportional to bed shear strength. Rayleigh probability function has been proposed as the distribution of bed shear stress. The physical parameters needed for the model are effective sediment cohesion, volumetric concentration, entrainment velocity and gelling concentration. The statistical parameter of the model, named scale parameter, is applied to correlate the model, for practice. The experiments were conducted in a straight recirculating flume filled with natural cohesive sediments. It has been shown the scale parameter, regardless degree of consolidation, has a strong power relation with relative critical bed shear stress. This parameter can easily be determined by two fast erosion tests. The model estimated erosion flux has shown well agreement with experimental measurements.

کلمات کلیدی:

cohesive sediment, erosion flux, erosion coefficient, entrainment velocity, gelling concentration, shear stress, Rayleigh distribution, critical shear stress, effective cohesion, volumetric concentration

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