

Abstract:

Analysis and prediction of erosion and sedimentation in rivers is one of the most complex topics in the sediment transport, and cognition and prediction of these changes are necessary in order to control of the river. In recent years increasing deposition and sedimentation in the Sistan river bed cause significant reduction in the dewatering of river. In the river simulation using of mathematical models are more common than physical models due to time-consuming and cost. In this study, erosion and sedimentation in Sistan rivers were predicted using common one-dimensional models of the HEC-RAS and GSTARS. Therefore at first, sediment transport equations used in HEC-RAS and GSTARS models were compared with respect of ability to estimate of the Sistan river sediment in hydrometer station of Kohak; then Sistan river simulation has been conducted with both models in similar condition during the years 2006-2007. Comparing the results of the sediment transport equations in HEC-RAS and GSTARS models indicated Toffalti equation in both models had the best answer but in GSTARS model, RMSE is less. The results of flood simulation in 2006-2007 performed by HEC-RAS & GSTARS models indicated that GSTARS model estimates 526696 m³ of sedimentation But HEC-RAS model estimates 135019 m³ of erosion in the reach of as the Jarikheh in Hirmand river divergence to Sistan dam; also comparing the cross section changes in both models show that GSTARS model simulated erosion and deposition better than HEC-RAS model due to using the concept of stream tube.

Keywords: Sediment, Sistan River, HEC-RAS, GSTARS.



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Comparing HEC-RAS and GSTARS3 models in simulation of the Sistan River behavior

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