Abstract

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Hydrodynamic Modeling of Damietta Branch Using 2D Finite Element Model

Changing the bed topography of natural rivers is not a stable process ,as natural rivers is the result of natural balance between the quantities of water and sediments introduced into the channel, the caliber of the sediments, and the history and physiographic of the landscape through which the river runs. In Dametta Branch of the river Nile in order to use the branch for navigation the bed topography was excavated to increase the water depths along the reach .the excavation was designed to give a minimum depth of 2.5 m and width 42 m along the navigation route. After seven years a hydrographic survey was done to know how stable the route is. The topography of Damietta branch at year 2000, the design of the navigation route, the topography of year 2007, the water levels at downstream delta barrage and at benha W.L. gauge and discharges passing in Damietta branch were collected. It was found that the navigation route was refilled and lost 80 % of its depth and the places next to the route were scoured .in this research the RMA2 module (2d depth averaged hydrodynamic modeling software) under SMS interface was used to model 60 km of Damietta branch from delta barrage at Qanater to Benha gauge . The RMA2 software has a problem in diverging if the number of dry nodes increased. Anew technique to edit the data was done to help the RMA2 to converge and three different meshes with different widths that accommodate the discharges at each period of the year were used. the result of the research were The places where the depths will not be enough for navigation and the minimum discharge for navigation were detected.