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Morphological Changes in Damietta Branch Due to Human Intervention

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بسم الله الرحمن الرحيم

"قالوا سبحانك لا علم لنا إلا ما علمتنا إنك أنت العليم

الحكيم"

صدق الله العظيم

بسم الله الرحمن الرحيم

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و أود أن أشكر عائلتي, جميع زملائي علي تعاونهم معي أثناء إجراءي للبحث.

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ABSTRACT

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 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. It was found that the navigation route was refilled and lost 80 % of its depth and the places next to the route were scoured.

This research aims to check the reliability and applicability of using 2D numerical models on the river Nile and use the2D modeling in predicting the effect of any human intervention in Damietta Branch. 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 SED2D module (2d sedimentation modeling software) was used to predict the changes in bed over 7 years. Some problems in the SED2D module like changing Boundary Condition in long term prediction, coupling of sediment and hydrodynamic runs, calipration of settling velocity and diameter of particle were solved using programming and sensitivity analysis.

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