One dimensional model to study hydrodynamics properties for north part of Shatt Al Arab River (south Iraq)

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ABSTRACT

Mike 11 hydrodynamic (HD) modeling is used for simulating hydrodynamic behavior of northern part of Shatt Al Arab which has 64 Km length starts from Qurna confluence (upstream river) toward Basrah city at Maqal port (downstream river). Mike 11 is river modeling system developed by Danish Hydrologic Institute, (DHI). Its performed an implicit finite difference computation of unsteady flow in rivers based on the saint Venant equations. The process of simulation has achieved in Marine Science Center, Basra University in Iraq, where the package softwere is introduced. The study area grid has created by TM Landsate Satellite image, and five of cross sections distributing along studied river part, which necessary data to make network file for simulation processes, as well as, It is open boundary type of upstream and downstream, where the discharge(Q) value at upstream is constant that equals 300 m3/s. And the time series file of water level (H) of Shatt Al Arab downstream was created with 30 days period, which started 01 /03 / 2009 to 31 /03 / 2009. The model relationship of (Q&H) appears a change zone in river discharge levels at starting the chainage (45000 m), where fluctuate between (200-400)m3/s., but as 55500 of chainage, the Discharge levels obviously is change between (2000 – 2500) m3/s. with average (50 -500)m3/s. The max. Conveyance value was 12600 m3 at 41000 m of chainage as 3312m2 of cross-section area and 3.61meter of water level. But min. Conveyance value was 7000 m3 at 64000 chainage as cross-section area equaling 2000 m2 and 2 meter of water level. Cross sections models appear asymmetrical shapes, where begin with shallow depths between (1.5-3.5m) at right bank – towards downstream-. These depths continue to mid of channel, then started the deep levels continue to end of width of cross section.