Effect of River Training Project on Hydrodynamics Flow Circumstances by 2D Finite Element Numerical Model

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Abstract

Based on the verified two dimensional(2D) finite element model for river flow simulation, the effect of estuary training levees on the water flow and sediment movement in the Yellow River estuary is analyzed. For disclosing the effect of setting the two training levees on the flow and sediment motion, the calculation and analysis for the two projects, (one is no levees, the other is setting up two no levees) are given. The results show that when setting up two training levees, water flow is bound by levees and the water flows become more concentrated. As a result, velocity increases in the main channel, sediment carrying capacity of water flow increases correspondingly.

Table shows the position and point numbers (named respectively No.2260, No.2201, No.2242, No.2283) and magnitude comparison of maximum sediment concentration in the condition of setting up levees with that of no levees. It is found that the point of the maximum sediment concentration go outside from No.2242 to No.2283, the distance of the two points is 920 m long. So setting up levees can play a very effective role.

Table 1 The position and point numbers comparison of maximum sediment concentration			
	Items	Mesh points numbers	Sediment concentration (kg/m ³)
Spring time	no levees	2160	9.6
	setting up levees	2201	10.5
Ebb time	no levees	2242	11.3
	setting up levees	2283	13.5

Figure: Distance of selected mesh point number along the river and estuary to point No.15