

**Flood Computations for Changing River Environment in Korea****KYUNG SOO JUN\***

The primary objective of the Four Major Rivers Restoration Project, the largest pan-national river project in Korean history in terms of its spatial coverage and budget, is to secure water in river channels. This is achieved by large-scale channel dredging and constructing a number of weirs in low flow channels. Among the four major rivers, the Nakdong River is the focus of the project. The weirs and estuary barrage in the Nakdong River are partially gated. The gates are to be opened when a flood occurs to prevent water level rise. On the other hand, the water level of the weirs and estuary barrage should not fall far below the normal pool level at the end of the flood because it is required to secure water in the low flow channel. Gate operation strategies for weirs and estuary barrage are needed to satisfy those two conflicting objectives, and appropriate simulation models are essential for developing them. A numerical model was developed that can simulate gate openings of estuary barrage and a series of weirs as well as the unsteady flow in the Nakdong River, Korea. The computational model can appropriately simulate composite flows at multi-functional weirs including weir overflow, orifice-type flow, and fluvial-type flow. Operation strategies for weirs were established such that gates are closed for water level below a certain reference level and gate openings increase as the water level rises. The prescribed operation conditions were well simulated by the model, and sensitivities to the parameters of the gate operation strategy were analyzed. The computational model developed herein has been utilized in establishing operational strategies during flood periods for a series of the weirs and the Nakdong Estuary Barrage.

**Keywords:** Flood computation, Gate operation, Unsteady river flow, Nakdong River

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