

Feasibility of curtain weir installation for water quality management in Daecheong Reservoir

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ABSTRACT

The study was aimed to determine the optimal location of a vertically moveable curtain weir in Daecheong Reservoir (Korea) and to assess its effectiveness for the control of algal bloom in the reservoir. A laterally averaged two-dimensional hydrodynamic and eutrophication model (CE-QUAL-W2) was used to simulate water quality variables and the effect of curtain weir. The original model was modified to accommodate vertical displacement of the weir according to the water surface fluctuation. The model calibrated in a previous study was validated for different hydrological conditions representing drought year (2008) and normal year (2006) for the study, and adequately reproduced the temporal and spatial variations of temperature, nutrients and phytoplankton concentrations. The performance of curtain weir on the control of algal bloom was assessed by applying the validated model to 2001 when an abnormal mono-specific bloom of the *Microcystis aeruginosa* had developed and 2006 based on 9 different installation scenarios. The reduction rates of algal concentration (Re) were placed in the range of 11.2–40.3% and 20.3–56.7% for 2001 and 2006, respectively. The performance of curtain weir was varied for different locations and different hydrological years. Overall, the performance was improved as the weir was installed further downstream.

Keywords: Algal bloom; Curtain weir; CE-QUAL-W2; Daecheong reservoir

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