



3-D hydrodynamic modeling of Yongdam Lake, Korea using EFDC

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ABSTRACT

The successful water quality prediction requires accurate information of water movement and interaction kinetics of components in water. Recent researches showed significant advancement in the combined use of hydrodynamic model and water quality model for surface water quality predictions. USEPA upgraded this progress to 3-dimensional (3-D) level through modification of environmental fluid dynamics code (EFDC) hydrodynamic model to provide water movement information to water quality analysis simulation program (WASP) water quality model for multiple components. However, a 3-D model requires heavy computation time and extensive data for calibration, therefore, optimum layout of computational grids is a most important factor for application. This study summarizes performance of EFDC in the prediction of water level thus water volume change dynamics and vertical water temperature profile variations. This model was applied to Yongdam Lake, Korea and successfully modeled water level and vertical temperature profile of the study site. The resultant 3-D hydrodynamic information can be transferred to 3-D water quality model, WASP and can be used for water quality management purposes.

Keywords: 3-D hydrodynamic model; EFDC; WASP; Water quality model; Yongdam Lake

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