

Verification of Flow Analysis Model for Tracking Sources of Water Chemical Accidents

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(a) Purpose of study or research hypothesis

Pollution accidents in the water environment are increasing due to the leakage of harmful chemicals, and disaster prevention measures are required accordingly. Therefore, it is required to identify the behavior of hazardous chemicals through the model of the flow analysis and to respond to chemical accidents.

(b) Key issue(s) or problem(s) addressed

If harmful chemicals are introduced into rivers and lakes, they can cause various problems, such as water pollution and destruction of ecosystems, and the damage caused by them is considerable.

The first issue that should be addressed in identifying the behavior of harmful chemicals entering the stream is to accurately identify the flow of the stream. Therefore, it was intended to solve this problem by increasing the accuracy of the flow analysis model.

(c) Methodology or approach used

The Andong River Experimental Center conducted hydraulic tests to reproduce the ecological and physical structure of the river and hydrologic phenomena. Therefore, accuracy was verified by comparing the results of hydraulic test in Andong River laboratory with the simulation results of the flow analysis model 'HDM-2D'. In addition, the model was tested by comparing the results of 'RMA2', a commercial model for two-dimensional flow analysis.

(d) Results or conclusions derived from the project

As a result of the experiment, the difference between the simulation results and the measured results was insignificant, and the superiority of the flow analysis model 'HDM-2D' was proved. In the future, The behavior of pollutants based on the velocity field would be thoroughly investigated.

(e) Implications of the project relevant to congress themes

Hazardous chemical spills are accidents that can have a significant impact on water resources and ecosystems. In addition, it is urgent to prepare countermeasures. Therefore, in order to develop the ability to solve problems, it must be able to accurately understand the flow analysis of rivers along with technological development. As a result of the study, we found that the simulation of flow analysis through 'HDM-2D' is very similar to the river flow in the field, so that we can predict the behavior of chemicals in the event of a hazardous chemical spill.

Keywords : Chemical accidents, HDM-2D, Water resources, Ecosystems