

Numerical Study on Dispersion of Turbid Overland Flow in Stratified Waters

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It is very important issue that dispersion of turbid water in coastal and land waters. There are several kinds of generation mechanism of turbid waters. This study focuses on overland flow on dry up area in particular. The turbid overland flow is induced by erosion of bottom suspended solids and transport adsorbed matter to down the stream, which is induced in intertidal zone and dam usually. These phenomena are very complex and a three-dimensional baroclinic flow model has been applied for simulating one. Usually, Sigma-coordinate system is applied to simulate these phenomena. However, we tried to apply Cartesian-coordinate system because we want to simulate hydrodynamics under the condition with stratification and steep slope.

Hydrodynamics model with dry and wet function was constructed by improvement of present quasi-3D baroclinic flow model. Conservation of suspended solid was evaluated by hindcast simulation of actual waters with both dry up area and stratified water area. As a result, water temperature of overland flow was changed by meteorological effect and was dominated a depth of inflow in stratified waters downstream. Moreover, sedimentation rate and bed fluctuation in both dry up area and stratified waters were evaluated. According to this case study, we found that the numerical model divided into various grain diameters is effective for improve reproducibility of numerical simulation.

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