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Investigation of the mechanism of contaminant release through the sediment-overlying water interface[1] JIA-HONG GUO, SHU-JUN ZHENG, DAO-ZENG WANG, Shanghai Institute of Applied Mathematics and Mechanics, Shanghai University, ENVIRONMENT FLUID DYNAMICS COLLABORATION
— After the external pollutant discharge has been reduced, the release of the contaminant from the sediment to the overlying water may cause the river and lake be contaminated again. On the condition that the overlying water flow does not lead to sediment suspension, numerical and experimental researches are carried out for the contaminant release mechanism through the sediment-overlying water interface. In the numerical simulation, the overlying water flow is calculated as turbulent flow. The sediment is regarded as isotropic homogeneous porous medium, therefore the seepage field in the porous sediment layer is obtained by solving Darcy's equations. Several coupled two dimensional steady and unsteady flows of the overlying water and the pore water in the sediment are calculated. Based on the flow fields obtained, the unsteady contaminant solute transportation process in the sediment and the overlying water is numerically simulated, as the shapes of the sediment-overlying water interface are flat or periodic triangular respectively. The numerical results agree with the experimental results quite well. The results show that the exchange of the pore water and the overlying water is an important factor which decides the release flux of the contaminant from the sediment to the overlying water.

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Jia-Hong Guo
Shanghai Institute of Applied Mathematics and Mechanics,
Shanghai University

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