

FACTORS CONTROLLING CONTAMINANT TRANSPORT THROUGH THE FLOOD SEDIMENTS OF THE SAGUENAY FJORD: NUMERICAL SENSITIVITY ANALYSIS

Dueri, S. and Therrien, R. Département de Géologie et génie géologique, Université Laval, Québec, Canada

REFERENCE

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ABSTRACT

In July 1996, two days of intense rainfall caused severe flooding in the Saguenay region and led to the discharge by rivers of several million cubic meters of clean sediments to the Fjord. This turbidite layer, composed of clean sediments, represents a potential barrier for the migration of heavy metals and PAHs from the underlying contaminated sediments towards the new sediment-water interface. A numerical model has been developed to simulate the vertical migration and remobilization of dissolved contaminants in the capping layer. The model includes the main physical, chemical and biological factors affecting the contaminant flux in the cap. Calibration of the model has been achieved through comparison with the data collected during the field and laboratory characterization of the sediments of the Saguenay Fjord. A detailed sensitivity analysis, based on factorial design, shows that the model parameters associated with bio-irrigation have the greatest impact on the model output and by extension on the effectiveness of a capping layer.