



Predicting the geochemical response of sediments affected by hypoxia in the Lower St-Lawrence Estuary

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Oxygen concentration in the bottom waters of Lower St-Lawrence Estuary has been declining by an average of 1 micromol/l/year over the past 70 years, causing severe hypoxia. We use a reaction-transport model of sediment diagenesis to predict what impact further decline in the oxygen concentration will have on sediment biogeochemistry. We calibrate our model and propagate it forward in time to predict the vertical distribution of solid and dissolved species within the sediment column and the magnitude of fluxes at the sediment-water interface. Preliminary results indicate that fluxes of iron and manganese will increase and that the sediment will become depleted in solid-phase manganese and oxidized iron; the phosphorus flux will remain largely unaffected. The sediment response depends greatly on how the benthic community responds to prolonged hypoxia, as well as on the coupling between the sediment and the water column.