TITLE:

AUTHOR: **Marcela Zanetti Corazza**

ABSTRACT

The river sediment pollution by metals and the aquatic ecosystem impacts occur in a dynamic process. The transport and the metal transformations in rivers have been enough studied through mathematical models. The Monte Carlo Simulation (MCS) is a methodology applied to explain the variability of parameters in the transport and fate modelling of pollutants and it was used in this study to discuss the copper transport and fate in the sediment of the Tibagi river's sub–basin tributaries. The statistical distribution of the variables was described by a dataset obtained for copper concentration using sequential extraction, organic matter amount and pH. The stochastic model for copper transport in the river sediment was implemented by the Monte Carlo simulation technique using MatLab 7.0 mathematical software. In order to model some suppositions, the sediment and the water column in the river ecosystem were considered compartments. The copper transport in the water column was described by a spacetemporal equation considering the copper in longitudinal flow for each sampling local and by the metal's dispersion process. The copper concentration in the water column assumes an exponential decreasing behavior. The each Cu-extractor medium concentrations in the sediment for the sampling locals were used as entrance variables and controlled by the metal deposition velocity (Vd) in the sediment. It was assumed a decreasing exponential relationship describing the copper behavior for the three extractors (Cu-exchangeable, Cu-oxides of Fe/Mn and Cuorganic matter). Uniform statistical distributions (pdf – function density of probability) were adopted for most of the entrance variables and the variables external to the model.