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Seasonal variation of Heavy Metal Pollution and numerical Modeling in the River and Dam(Case study: Zarineh river and Bookan dam in Iran)

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Based on the deep studies of existing mathematical models, a mathematical model that expresses the dynamic of transport and transformation of heavy metals in the rivers has been presented. In this model, the basic principles of chemistry in the environment, hydraulic and fluid transfer dynamics have been used as well as seasonal variations of the studied heavy metals and influence of the mentioned physicochemical parameters on concentration variations of the heavy metals were investigated. The results of sediment effect can be investigated by the proposed models on the transfer and evolution of heavy metals pollution. For example, the transmutation and transport of heavy metal pollutants in a steady state flow containing sediment are studied using the present model. The results indicated that, the transportation of heavy metals not only have common characteristics of general pollutant but also have features of transport and transformation induced by the movement of sediments. The seasonal variations could be resulted from natural or anthropogenic sources and ambient conditions such as water temperature, EC, DO, pH, etc. Significant relationships were observed between concentration of some heavy metals and physicochemical parameters during wet and dry periods.

Keywords: Numerical Simulation; Heavy Metal; Pollution; Sediment; Physicochemical parameters; Seasonal variation