

The Emission Etudy of Pollution in Estuary by Using Numerical Model

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Abstract

Due to the increasing use of the sea, marine pollution is extremely important. In fact, stopping along the estuary shoreline fragmentation, progress through tabs (like the sea or inland river entrance to the sea) is. The diffusion of pollution in estuary affect to the density and diversity of biological organisms in the aquatic environment. To study pollution diffusion on Mahshahr estuary using the analysis of data and numerical modeling (Advection Dispersion module of Mike21 software), simulate the effect of increasing geometric dimensions estuary (length, depth and width) was investigated on pollution diffusion. Effect of change factors the estuary geometric on pollution was run out five different modes (including different depths and widths in the specified locations), and results were as follows: Increasing estuary length was caused decrease pollution in all parts estuaries. Increase estuary depth and current velocity (high water) were resulted to decreasing pollution in the estuary. Increase estuary depth and current velocity decrease (high water) were resulted into increased pollution in the estuary. Increasing estuary width was caused increased pollution in estuary. Thus, according to the geometrical estuary dimension Mahshahr, diffusion of pollution in the estuary was investigated. Thus, prediction effects physical factors (geometrical factors) on diffusion of chemical agents (pollution) became possible.

Keywords: Diffusion, Estuary, Modeling, Pollution, Simulation.

Introduction

Pollution of marine waters has from long time been of interest to humans. Sea pollution is defined as: direct or indirect entering of any material or energy to the sea environment which cause unwanted effects the environment, water quality, landscape or human welfare. Sea pollution is mostly originated from existence of physical, chemical and biological pollutants, and also heavy metals in water column and sediments (Akbarinasab, M. and Ketabdari, M.J., 2010). Estuary because the connection to sea quite influenced is sea level vertical oscillations (tide) therefore, the water level is variable in it (Samadyar, H. and Javid, A.H., Winter2007). When there is Tide, the large amount of suspended mud is transferred in estuary and is sedimented in the relatively calm estuary conditions. Diffusion of pollution is done in two ways: By convection method; transmission of Contamination by water flow. The second method; transmission of contamination from more concentrate to lower concentration (Samani, M.V.H., Summer2003). One of the important characteristics the materials the deposited in sediments this is that salinity change in sediments is less than salinity change in the layer water upper it

(Ghazi, A. and Bidokhti, A.A. and Azam, M. and TorabiAzad, M., Summer2010). In these conditions, material precipitated to possess tolerance a lot is in changes extreme salinity and other chemical agents (Kashephiolasl, M. and Javid, A.H. and Shaphiee, Z., Spring2010). In general, accumulation of mineral particles in sediment occurs and also there is a possibility of deposited of organic material. Organic materials may be transferred via tidal currents into estuary and may cause pollution (Khedri, P. and Sadrinasab, M. and Chegini, V. and Pashazanoosi, H., Winter2011), (Samadyar, H. and Javid, A.H., Winter2007). In the present study, the effect of geometric factors such as the length, width and depth estuary on water level change and also flow and pollution diffusion in Mahshahr estuary was examined. Using theoretical methods and results of field measurements, numerical model (by using software Mike21) for the various options (including different depth and width) was run and the results were compared. The present investigation excellence in compared with past investigations is the software modeling in order to assessment effected of physical