

Modelling Suspended Solids Transport in Dammam (Saudi Arabia) Coastal Areas

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Abstract : Some new projects (new proposed harbor, recreational projects) are considered in the eastern coasts of Dammam city, Saudi Arabia. Dredging operations would significantly alter coast hydrological and sediment transport processes. It is important that the project areas must keep flushing the fresh sea water in and out with good water quality parameters, which are currently facing increased pressure from urbanization and navigation requirements in conjunction with industrial developments. A suspended solids or sediments are expected to affect the flora and fauna in that area. Governing advection-diffusion equations are considered to understand the consequences of such projects. A numerical modeling study is developed to study the effect of dredging and, in particular, the suspended sediments concentrations (mg/L) changed in the region. The results were obtained using finite element method using an in-house or commercial software. Results show some consistency with data observed in that region. Recommendations based on results could be formulated for decision makers to protect the environment in the long term.

Keywords : finite element, method, suspended solids transport, advection-diffusion

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