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Modelling of Saltwater Intrusion in Kelani River Estuary

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Abstract

Kelani River is the third largest river in Sri Lanka and it falls to the ocean at north of Colombo City. The Kaleni River is the main source of domestic water supply to the Capital Colombo. During droughts, saltwater intrusion causes a severe problem for the water supply, whereas pumping station, Ambatale is located about 15 km from the river mouth. This study presents the saltwater intrusion in to the lower Kelani River estuary by means of field observations and numerical model simulations of three-dimensional Estuary Lake Computer Model (ELCOM). The model simulated salinity profiles at different sections at different seasons were compared with observed salinity profiles. The overall performance of the model is in reasonable agreement with the field data. The model was then used to investigate the change in salt water intrusion as a result of changes in inlet bathymetry, open ocean sea level and river discharge. During droughts and the period of mean sea level is high (January-March), the saltwater intrudes more than 15 km from river mouth with bottom salinity exceeding 25 psu.

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