

Abstract

Study region

This study was undertaken in the Athi-Sabaki river basin in Kenya in East Africa.

Study focus

The study focused on the determination of the influence of streamflow variability on salt fluxes. This involved monitoring of river discharge and river salinity in the period between 2012 and 2018.

New hydrological insights

: This study demonstrates that Athi-Sabaki river discharges significant quantity of salt to the sea. There are significant seasonal and inter-annual variations in salt fluxes that are due to variations in river discharge and rainfall in the basin. The relationship between streamflow variations and variations of salinity in the river was inverse with highest salinity concentrations and fluxes occurring during low flow conditions. The river salinity and TDS concentrations decreased with an increase in river discharge due to dilution effect and flushing of salt from the river. The highly polluted sub-basins draining through the City of Nairobi exhibited relatively higher salinity and salt fluxes as compared to non-polluted ones draining rural areas. The total salt flux in the basin ranged between 29×10^3 and 261×10^3 tons year⁻¹. The relatively high salinity and salt fluxes were attributed to the discharge of wastewaters, seepage of groundwater and irrigation return flows. The study calls for water pollution control, sustainable irrigation and landuse practices in the basin.

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