

Saline Water Transgression into Fresh Coastal Groundwater in the Confined Aquifer of Lagos, Nigeria

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Abstract : Groundwater is an important constituent of the hydrological cycle and plays a vital role in augmenting water supply to meet the ever-increasing needs of people for domestic, agricultural and industrial purposes. Unfortunately, this important resource has in most cases been contaminated due to the advancement of seawater into the fresh groundwater. This is due to the high volume of water being abstracted in these areas as a result of a high population of coastal dwellers. The knowledge of salinity level and intrusion of saltwater into the freshwater aquifer is, therefore, necessary for groundwater monitoring and prediction in the coastal areas. In this work, an advection-dispersion saltwater intrusion model is used to study and simulate saltwater intrusion in a typical coastal aquifer. The aquifer portion was divided into a grid with elements and nodes. Map of the study area indicating well locations were overlain on the grid system such that these locations coincide with the nodes. Chlorides at these well were considered as initial nodal salinities. Results showed a highest and lowest increase in simulated chloride of 37.89 mg/L and 0.8 mg/L respectively. It also revealed that the chloride concentration of most of the considered well might climb unacceptable level in the next few years, if the current abstraction rate continues unabated.

Keywords : saltwater intrusion, coastal aquifer, nodal salinity, chloride concentration

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