



Numerical simulation of sea water intrusion on the northern coast of Albania

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Seawater intrusion into the confined aquifer took place between Erzen and Mat river in the northern part of the Albanian Adriatic Coast. A severe salt water intrusion is taking place in the groundwater system due to low phreatic water levels in the area. Seepage quantities in the five selected points continue to decrease due to a decrease in upward flow gradients in the hydrogeologic system, caused by an increase in salinity. Chloride concentrations at several wells were observed to be increased steadily into Mat river where were at their peak.

A three-dimensional finite element model (SUTRA) has been developed to simulate the spatial and temporal evolution of hydraulic heads and chloride concentrations of the groundwater. SUTRA (Saturated-Unsaturated Transport) is a computer program that simulates fluid movement and the transport of either energy or dissolved substances in a subsurface environment. The simulation model was based on the transition zone approach, which requires simultaneous solution of the governing water flow and solute transport equations. Various aquifer parameters were verified with the numerical model in order to obtain satisfactory matches between computed values and observed data