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Assessment of Groundwater Quality in the Gaza Strip, Palestine Using GIS Mapping

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ABSTRACT

A Geographical Information System (GIS) tool was used to construct thematic maps for groundwater quality in the Gaza Strip. Environmental data were integrated and an overall picture about the spatial variation in the groundwater quality of the Gaza Strip was defined. The integrated spatial maps helped to refine information on land use, soil types, depth to groundwater table, environmental "hot spots", and contaminant concentrations of the study area. The groundwater quality maps have been derived from the results of an eight-year monitoring program for major anions, cations and heavy metals. An environmental hot-spots map was derived from potential contaminating sources, showed direct and indirect influences on groundwater quality. The GIS maps showed not only contaminant distributions but also illustrated the need to improve the groundwater quality management methods. Several contaminants pose great problems in the water of Gaza. Integration of water data and GIS maps for all parameters revealed that there is probably no drinking water in Gaza according to the WHO standards. Moreover, the new maps of 2008 could be used as base-line for water planners and policy makers as well as guidelines for the Palestinian people to manage and protect their groundwater. Increased water demand from population and economic growth, environmental needs, land use changes, urbanization, groundwater mining, deterioration of water quality, pollution from local and diffuse sources, environmental hot-spots and impacts on public health and ecosystems are all factors that can create a severe water quality crisis as well as water shortage problems.

KEYWORDS

Gaza, GIS, Groundwater Quality

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