Desalination and Water Treatment
www.deswater.com
doi: 10.1080/19443994.2013.797368

52 (2014) 1967–1979
February

Taylor & Francis
Taylor & Francis Group

Assessing groundwater quality in a coastal area using the GIS technique

Mervat El-Hoz[a,*], Abir Mohsen[a], Amal Iaaly[b]

[a]*Department of Civil Engineering, University of Balamand, Al-Koura, Lebanon*
Tel. +961 6930250x3971; Fax: +961 6930278; email: mervat.elhoz@balamand.edu.lb
[b]*GIS Center, University of Balamand, Al-Koura, Lebanon*

Received 30 November 2012; Accepted 8 April 2013

ABSTRACT

The objective of the study is to (1) provide an overview of present groundwater quality, (2) determine spatial distribution of the studied groundwater quality parameters using geographic information system (GIS) software, and (3) generate groundwater quality zone map for the city of Tripoli. Groundwater physicochemical and microbiological characteristics of the Tripoli City aquifer in Lebanon were evaluated over a one-year period. Twenty-four samples were collected from 24 private wells. It is the first study of its kind in Lebanon where the GIS was applied as an important tool for spatial analysis and data visualization. The groundwater quality information maps for the studied parameters (dissolved oxygen, temperature, pH, conductivity, total dissolved solid, salinity Cl^-, NO_2^-, NO_3^-, and *Escherichia coli*) and locations of the whole study area have been prepared using GIS spatial interpolation technique. The evaluation result indicates that the levels of the studied parameters were above the Lebanese standards desirable for human consumption and a great attention of the concerned parties is highly needed. Moreover, it is concluded that a combination of groundwater quality parameters and GIS methods is very useful as GIS provides efficient capacity to visualize the spatial data.

Keywords: Groundwater quality; Geographic Information System; Spatial analysis

*Corresponding author.

Presented at the 6th International Conference on Water Resources in Mediterranean Basin (WATMED6), 10–12 October 2012, Sousse, Tunisia