

Accepted Manuscript

Research papers

Surface – ground water interactions and hydrogeochemical evolution in a fluvio-deltaic setting: The case study of the Pinios River delta

Ioannis Matiatos, Vasiliki Paraskevopoulou, Konstantinos Lazogiannis, Fotini Botsou, Manos Dassenakis, George Ghionis, John D. Alexopoulos, Serafim E. Poulos

PII: S0022-1694(18)30239-7
DOI: <https://doi.org/10.1016/j.jhydrol.2018.03.067>
Reference: HYDROL 22700

To appear in: *Journal of Hydrology*

Received Date: 15 September 2017
Revised Date: 26 March 2018
Accepted Date: 28 March 2018

Please cite this article as: Matiatos, I., Paraskevopoulou, V., Lazogiannis, K., Botsou, F., Dassenakis, M., Ghionis, G., Alexopoulos, J.D., Poulos, S.E., Surface – ground water interactions and hydrogeochemical evolution in a fluvio-deltaic setting: The case study of the Pinios River delta, *Journal of Hydrology* (2018), doi: <https://doi.org/10.1016/j.jhydrol.2018.03.067>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Surface – ground water interactions and hydrogeochemical evolution in a fluvio-deltaic setting: The case study of the Pinios River delta

Ioannis Matiatos^{a1*}, Vasiliki Paraskevopoulou^b, Konstantinos Lazogiannis^a, Fotini Botsou^b,
Manos Dassenakis^b, George Ghionis^a, John D. Alexopoulos^a, Serafim E. Poulos^a

^a Department of Geology and Geoenvironment, National and Kapodistrian University of Athens, Panepistimioupoli, Zografou, 15784, Athens, Greece

^b Laboratory of Environmental Chemistry, Department of Chemistry, National and Kapodistrian University of Athens, Panepistimioupoli, Zografou, 15784, Athens, Greece

* Corresponding author. *Email address:* imatiatos@geol.uoa.gr

Keywords: Deltaic aquifer; Hydrogeochemistry; Principal Component Analysis; Water Quality Index; Water interactions.

Abstract

River deltas sustain important ecosystems with rich biodiversity and large biomass, as well as human populations via the availability of water and food sources. Anthropogenic activities, such as urbanization, tourism and agriculture, may pose threats to river deltas. The knowledge of the factors controlling the regional water quality regime in these areas is important for planning sustainable use and management of the water resources. Here, hydrochemical methods and multivariate statistical techniques were combined to investigate the shallow aquifer of the Pinios River (Thessaly) deltaic plain with respect to water quality, hydrogeochemical evolution and interactions between groundwater and surface water bodies.

Water quality assessment indicated that most of the river and groundwater samples fully comply with the criteria set by the Drinking Water Directive (98/83/1EC). The river is recharged mainly from springs of the Tempi valley and the shallow aquifer, and to a lesser degree from precipitation, throughout the year. The hydrogeochemical characteristics indicated a cation (Ca, Mg, and Na) bicarbonate water type, which evolves to calcium-chloride, sodium-bicarbonate and sodium-chloride water type, in the northern part of the delta. Calcite and dolomite dissolution determined the major ion chemistry, but other processes, such as silicate weathering and cation exchange reactions, also contributed. In the northern part of the plain, the interaction with the deeper aquifer enriched the shallow aquifer with Na and Cl ions.

¹ Present address: International Atomic Energy Agency, Vienna International Centre, 1400 Vienna, Austria. E-mail address: i.matiatos@iaea.org.

Download English Version:

<https://daneshyari.com/en/article/8894749>

Download Persian Version:

<https://daneshyari.com/article/8894749>

[Daneshyari.com](https://daneshyari.com)