

Higher National School of Hydraulic

The Library

Digital Repository of ENSH



المدرسة الوطنية العليا للري

المكتبة

المستودع الرقمي للمدرسة العليا للري



**The title (العنوان):**

Contribution of Hydrogeochemical and Isotopic Tools to the Management of Upper and Middle Cheliff Aquifers

**The paper document Shelf mark P20-20 :( paper version not available)**

**APA Citation ( توثيق APA):**

Elaid Madene, Meddi Hind, Boufekane Abdelmadjid, et all (2020). Contribution of Hydrogeochemical and Isotopic Tools to the Management of Upper and Middle Cheliff Aquifers. *Journal of Earth Science* , vol 31 (n°5) , p. 993-1006. DOI ou URL : <https://link.springer.com/article/10.1007/s12583-020-1293-y>

The digital repository of the Higher National School for Hydraulics "Digital Repository of ENSH" is a platform for valuing the scientific production of the school's teachers and researchers.

Digital Repository of ENSH aims to limit scientific production, whether published or unpublished (theses, pedagogical publications, periodical articles, books...) and broadcasting it online.

Digital Repository of ENSH is built on the open DSpace software platform and is managed by the Library of the National Higher School for Hydraulics. <http://dspace.ensh.dz/jspui/>

المستودع الرقمي للمدرسة الوطنية العليا للري هو منصة خاصة بتثمين لإنتاج لأساتذة باحثي المدرسة.

يهدف المستودع الرقمي للمدرسة إلى حصر الإنتاج العلمي سواء كان منشورا أو غير منشور (طروحات، مطبوعات، مبداعات، مقالات الدوريات، كتب...) بثه على الخط.

المستودع الرقمي للمدرسة مبني على المنصة المفتوحة DSpace و يتم إدارته من طرف مديرية المكتبة للمدرسة العليا .

كل الحقوق محفوظة للمدرسة الوطنية العليا للري.

**Abstract:**

In the alluvial aquifers of Upper and Middle Cheliff (North-West Algeria), the groundwater quality is deteriorating. The objective of this study was to characterize the physical and chemical properties of these aquifers; and to evaluate the groundwater quality and its appropriateness for drinking and agricultural use. An investigation was carried out by estimating of the physiochemical parameters ( $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$ ,  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Cl}^-$ ,  $\text{SO}_4^{2-}$ ,  $\text{HCO}_3^-$ ,  $\text{NO}_3^-$ ,  $\text{Br}^-$  and TDS) to identify the chemical characteristics of groundwater. Moreover, the isotopic composition was examined to identify the sources of recharge of these aquifers. The groundwater geochemistry for the high water level (May, 2012 and June, 2017) and low water level (November, 2012 and October, 2017) was studied. Accordingly, water samples from 39 water sampling points were collected (October, 2017 and June, 2018), for the purpose of analyzing stable isotopes ( $^{18}\text{O}$ ,  $^2\text{H}$ ). The results show that the groundwater is mainly characterized by Ca-Cl and Na-Cl type. The chemical quality of the water is from fair to poor with the presence of nitrates used in agricultural and urban discharge. Also, the Br/Cl ratio gives indications on the origin of the salinity. This salinity is due to the leaching of chlorinated fertilizers, the dissolution of evaporite deposits and the rise of deep salty water by the fault of Chellif. While, the diagram of  $\delta^2\text{H} = f(\delta^{18}\text{O})$  indicates that the origin of the recharge of these aquifers is the Atlantic and Mediterranean oceanic meteoric rainwater.

**Key words:** Hydro-chemistry ; Management ; Isotopic analysis ; Groundwater ; Upper and Middle Cheliff ; Algeria

**Available from :** <https://link.springer.com/article/10.1007/s12583-020-1293-y>