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Holocene groundwater turnover in an coastal aquifer in Albania - mirrored by isotopes

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Mati River has formed a coastal aquifer in N. Albania serving as a water source for 220 000 people. The near shore portions of the aquifer have a brackish groundwater. A crucial question is to what extent the aquifer is recharged from the alluvial cone at the entrance of the river into the coastal plain and to what extent the brackish water is drawn into a large well-field supplying Durres, the second largest town in Albania. The brackish water was dated by 14C, resulting in ages between 4-7000 years BP. [U+F064]18O data showed that the brackish water was not a mixture between sea water and fresh water but had freshwater signature of -5 to -10 o/oo. The low values are caused by the oxidation of sulphides in a copper mining area upstream in the Mati River catchment (Demi 2003). Most likely the salinity is derived from diffusion from saline pore water in intercalated clay layers. A similar condition is found in the coastal Kerala aquifers in Southern India (Jacks et al., 2007). The water extracted in the large well-field has low salinity. [U+F064]34S data show that the pumped groundwater has a typical river signature with [U+F064]34S = 4-5 o/oo while the brackish near shore water has a sea water signature around 20-21 o/oo. Thus the extracted water is almost entirely supplied by current recharge from the alluvial cone. The salinity now restricted to pore water in the intercalated clay layers might be derived from the Flandrian transgression. A shore line has been observed close to the foothills in the plane by Fouache (2006). The paleo-levels of the sea is very variable along the Adriatic coast as this is a tectonic active areas along the seam between the African and the European plates (Allaj et al. 2001; Fouache 2006; Mathers et al. 1999).

References

Allaj S H, Baldassarra G & Shkupi D (2001) Quaternary subsidence zones in Albania: some case studies. Bull Eng Geol Env 59: 313-318.

Demi G (2003) Waste assessment of copper mines and plants in Albania and their impact on surrounding areas. Mining and Processing Technology Institute, Tirana, Albania. Report. 10 pp.

Fouache É (2006) 10 000 ans d′evoloution des pausages en Adriatique et en Méditerranée Orientale. Travaux de la Maison de l ′Orient et de la Méditerranée. No 45. 223 pp.

Jacks G, Shammas M & Warrior U (2009) Two coastal aquifers in South Asia and management options. In Groundwater Management. Ed. B S Palival. Scientific Publishers (India). Pp 133-140.

Mathers S, Brew DS & Arthurton RS (1999) Rapid Holocene evolution and neotectonics of the Albanian Adriatic coastline. J Coastal Research 15(2): 345-354.