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Isotopic assessment of the recharge of a coastal aquifer in N. Albania

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The River Mati coastal plain aquifers serve as a groundwater source for about 250 000 people. A major concern is the rate of recharge from an alluvial fan at the entry of River Mati into the coastal plain. The investigation revealed brackish groundwater close to the Adriatic coast. However, the groundwater was artesian indicating the sea water intrusion is not currently a threat. As per [U+F064]18O analysis this water was not a mix of old sea water but had the signature of the river water. The salinity is likely to be derived by diffusion from intercalated clay layers. 14C dating of the water showed ages of the most brackish water up to 7 000 years. Upstream there are a large number of active and abandoned copper mines and about 10 M ton of waste rock from these mines. The [U+F064]34S in the river water was close to the value for sulphides in this waste rock. Also the groundwater showed values close to that of the river. Only the brackish groundwater close to the sea shore had a sea water signature, probably derived from sulphate diffusion from the above mentioned clay layers.
Thus currently the groundwater extracted in a large well-field for the Durres town is more or less completely fed by recharge from the river. Large scale sand and gravel extraction in the alluvial cone is a threat to this recharge, lowering the head for flow and also presenting a risk for pollution by oil and fuel from the vehicles used for the sand and gravel extraction. It is recommended that a number of the artesian wells close to the Adriatic coast are monitored regarding the head above ground level.