174 - MONITORING AND CHARACTERIZATION OF A SPRING IN A FRACTURED SANDSTONE SLAB

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Fractured sandstone by tectonic and gravity actions could be classified as aquitard or aquifer according to the number and aperture of the fractures inside the rock mass. This kind of rock mass outcrops not frequently and sparsely in the Apennine and Alps chains. In the Emilian Apennines, which is mainly composed by sedimentary rocks (rich in clay), this type of rock is part of the Epiligurian Succession that outcrops for a 20 percent of the chain. The paper aims to highlight the first results of the semi-continuous water flow monitoring (discharge, electrical conductivity and temperature) and stable isotopic monitoring (delta18O and delta2H) of the spring that represents the drainage point of a vertical fractures system. This network joint characterizes the vertical scarp of a sandstone slab with thickness of 100 meters. The results show that the spring flow rate, the water electrical conductivity, temperature and isotopic values are influenced by the rainfall distribution pattern. Consequently during every rainfall event the spring discharge and water electrical conductivity increase, while the water temperature decreases and isotopic values become more negative. The new infiltrate water reachs the spring with a delay of 10-60 hours. The discharge variability index is around 270 percent. The fractured system is characterized by replacement effect of the preexistent groundwater. During the infiltration event, dissolution phenomena are observed along the wall of the fractures. A preliminary groundwater budget calculation highlights that only a potential infiltration coefficient higher that 75 percent is admitted to justify the total annual volume discharge from the fractures.