377 - DEFINING SPRING RECHARGE AREAS IN A FRACTURED AQUIFER BASED ON A MULTIDISCIPLINARY APPROACH (PALE DI SAN MARTINO, ITALY)

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Knowledge of groundwater flow paths in dolomitic mountain areas is generally very limited due to the high complexity and heterogeneity of the fractured aquifer system. The purpose of this study is to interpret the hydrogeology of the Pale di San Martino mountain group (Trento and Belluno Provinces) with particular regard to the regional structural setting, using a multidisciplinary approach: 1) Balanced cross sections and structural data were used to show the aquifer - aquiclude boundary orientation and to identify the main structural elements, focusing on fault zones and their hydraulic properties (barriers or conductor to flow); 2) Groundwater hydrogeological data, including streamflow discharge measurements and electrical conductivity, pH, temperature and oxidation reduction potential measurements were used to quantify and trace water fluxes; 3) Stable isotope tracer methods ($\delta\ ^{18}O$ and $\delta\ ^{2}H$) were used to refine the conceptual model of groundwater flow and to finally evaluate the recharge areas.

The study area is included in the Dolomites UNESCO World Heritage Site and covers approximately 250 Km^2. The dolomitic rock massif hosts the main regional aquifer and consists in a well-defined Hydrogeological Unit with clear boundary conditions. Given this peculiar setting, the study focused on the low drainage points of the groundwater system and in particular on five main spring groups. Data were acquired during seasonal campaigns from July 2014, showing a discharge rate comprised between 0,1 and 3 m^3/s for the main spring groups. Thanks to the construction of a balanced cross section and to the execution of a structural survey, it was possible to outline the groundwater compartmentalization and to identify the different hydrogeological basins related to the main spring groups. Furthermore, stable isotopes composition of the spring water was compared with the isotopic content of precipitation (sampled monthly in five sites) and was used to estimate the mean recharge elevation. All the data were combined in order to understand groundwater flow mechanisms and to verify the hydrogeological model.