



Hydrogeology and geochemical characteristics of groundwater in a porous aquifer connected with two karst systems, in Southern Switzerland

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Groundwater origin and hydrogeological processes strongly affects geochemical evolution of water within the aquifers. Because of that several studies uses major ion geochemistry as tracers giving insights on groundwater flow processes. This methodology has been applied successfully in different hydrogeological contexts (Grassian and Cortecci, 2005; Dafny et al, 2006; Wang et al, 2006).

The Laveggio aquifer, located in southern Switzerland, is an important source of drinking and industrial water for the Mendrisiotto district. Constituted by glacial and fluvioglacial deposits, it fills a valley developed over an important structural feature: the Lugano Line (IGIC, 1989). The aquifer, discharging to the Lugano lake is laterally limited by two important karst systems: The Monte Generoso and The Monte San Giorgio basins. Due to the structural evolution of the area the two karst systems have distinctive characteristics, the Monte Generoso Basin constituted mainly by limestones outcrops while in the San Giorgio basin dolomites are present (Bernoulli, 1964).

Several monitoring campaigns were carried out by the public authorities in order to acquire information about the quality of groundwater. 17 wells were sampled during several years and samples analyzed for major elements, pH, temperature, conductivity and some organic pollutants.

In this work geochemical data was directly interpreted, hydrochemical calculations performed using Phreecq (Parkhurst and Appelo, 1999) and spatially represented by using a geographic information system (GIS). We use the results of the chemical analysis and calculations to study the hydrodynamic of the aquifer and the relationship

with the karst systems.

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