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Geothermal fluid circulation within a regional scale carbonate reservoir. A review of data from Western Sicily, Italy.

Montanari, D., Minissale, A., Doveri, M., Trumpy, E., Gola, G., and Manzella, A.

Institute of Geosciences and Earth Resources - National Research Council of Italy (CNR)

Deciphering dimension and behavior of a regional-scale geothermal system is generally not an easy task, because of lack of evenly distributed data, and because it is easier to study the individual or few fluid occurrences (springs or alimentation areas) as distinct and isolated systems. This is especially true when working in wide areas and structurally complex contexts as in Western Sicily. Dealing with carbonates-hosted geothermal systems further complicates the approach due to the complexity of -fracture dominated- secondary permeability patterns. In order to unravel such a complex geothermal system, we demonstrated the strength of an integrated approach combining geological, geophysical and hydro-geochemical data. The proposed reconstruction of geothermal fluids circulation on a regional scale could be taken as exemplificative of the general behavior of low-to-medium enthalpy geothermal systems hosted in carbonate units that, due to the recent technological developments of binary plants, have become more profitable, not only for direct uses but even for power production.

