

## **Hydro-geochemical (KIRMAT) modeling of 20-year geochemical variations of granitic Strengbach catchment springs (Vosges massif, France)**

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Regular analysis of the major element concentrations in waters from springs emerging on the Strengbach catchment is made for more than 20 years for some of them and more than 10 years for the other. These data confirm the spatial variability of geochemical characteristics of the Strengbach sources linked, at least partly, to the soil and lithological variability of the substratum (Pierret *et al.*, 2014). The data also indicate that at first order the global geochemical fluxes exported from each spring are mainly linked to the spring discharge without significant variations over the last 20 years of the relationship linking these two parameters. There is also no observation of a significant variation of the relationship between the exported cationic and silicon fluxes and the spring discharge over the last 20 years. Only a significant decrease of Ca flux (and concentrations) is observed for the Strengbach spring during the last 20 years. Numerical simulations, performed with the KIRMAT hydro-geochemical code for the "CS" Strengbach sources, show that such a decrease can be considered as the response in the "bedrock" of the water-rock interactions to the variations of the soil solution chemical compositions recorded over the last 20 years, marked by a significant increase of pH and decrease of Ca, K concentrations. The simulation allows also for constraining the residence time of waters feeding the CS sources, ranging from 3 to 5 months.