

Clustering of physicochemical groundwater characteristics by multivariate analysis in Lins, São Paulo State, Brazil

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Initially, a hydrological characterization is done of the municipality of Lins, São Paulo State, where groundwater supply is a major water source. Also, a series of groundwater monitoring sites is registered in that area and 14 physicochemical quality determinands were sampled at each one during 1999. Samples were gathered in the periods of maximum, medium and minimum rainfall. For each water-quality determinand, binary graphs initially summarize the samples, site by site.

A complete geochemical analysis of the several sites considered, however, would not be an easy task. So, a multivariate analysis of water-quality determinands by clusters, considering some determinands as prioritary, was performed. The use of such a technique allowed for a reduction of the dimension of the multivariate space studied (to 3-D, in this case) and promoted an easier classification and discussion of results.

The comparison of sampling sites in terms of similar chemical elements is important for groundwater research, so the 53 sites considered here were clustered in such terms. As a result, groundwater quality throughout the municipality of Lins was classified leading to six different clusters.