Statistical methods – An important tool for understanding cave genesis?

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A preliminary cave classification scheme based on the main genetic processes and applied on 6205 caves in Lower Austria and adjacent areas brought surprising results (Oberender & Plan, 2018). So was the number of caves that had developed due to weathering and erosional processes almost as big as the number of caves, which had developed due to solution of carbonate rocks (i.e. karstic caves). In addition, regional differences in the dominant cave types of close-by mountains could not be easily explained by a single parameter as e.g. lithology. Therefore, the input data were extended to:

Basic cave data: length, vertical extent, maximum horizontal extent.

Location data: elevation, inclination and slope exposure (cardinal direction).

Lithology and tectonics: the cave's host rock lithology and its distance to the closest tectonic feature (cave entrance coordinates – nearest fault).

Hydrology: distance to the discharge system.

Applying a multiple target analysis on the data categories mentioned above shall help to identify the parameters that have a higher influence on cave genesis then others.