

## **Relating past occupation patterns to (paleo)environmental properties – hypothesis testing**

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Current archaeological discussions suggest that early human settlement distribution patterns, as preserved by the geological record, may be related to geospatial properties such as altitude, vicinity to water and habitat variability. However, to date, no quantitative analyses have been undertaken to either verify or falsify these hypotheses. In this study, data-driven methods were applied to test these hypotheses, specifically correlation and comparison of dataset variabilities. We compare the standard deviation and range from site altitude (as one example geospatial property) to draws from an area comprising these sites to make a statement whether settlement distribution is random in altitude or linked to a specific altitudinal belt.

This set of methods was applied to a dataset of mid-Upper Paleolithic (Gravettian) settlements from the Bohemian-Moravian Highlands and the Western Carpathians. It was possible to quantitatively and reproducibly demonstrate that settlements are related to a specific altitudinal belt around 200-300 m, as suggested earlier in a qualitative way. The discussed set of methods can be extended by incorporating additional geospatial parameters, potentially allowing comprehensive statements on the influence of these parameters on the distribution of early human settlements. Selecting a reference area used for testing and its (paleo)environmental properties is an important input, and several options are compared.