Supplementary Table S1. Technical details of the topographic environmental variables. All topographic analyses were done using SAGA GIS 6.4.0 (Conrad et al. 2015) and R 3.3.4 software (R Core Team 2016). If not specified, SAGA default settings were used in computation tolls.

1. **Diurnal anisotropic heating** was calculated using the non-modified digital altitude model to distinguish the sites with the potential for the highest temperature maxima. Because this study was located in the Northern Hemisphere, we set the maximum heat surplus to 202.5 °C, representing south-eastern slopes (Böhner & Antonić 2009).

2. **Sky view factor** was derived from the original digital altitude model, counting on a shading barrier not further than 50km, which is an area approximately two times larger than the region studied. This is enough to detect any shading barrier. The 50km threshold is effectively close to an infinity search radius for the region studied.

3. **Topographic position index** was calculated using the original digital altitudinal model with a search radius of 30 m. This threshold was optimal for the detection of deep valleys and the rocky outcrops typical of the area studied.

4. **Topographic wetness index (TWI)** was calculated using the pre-processed digital elevation model (DEM). Hydrologically correct (pre-processed) digital elevation model was calculated using the breaching and depression fill technique from 'WhiteboxTools v 0.16.0 by Dr. John B. Lindsay' implemented in R through R package 'whitebox' version 0.5.0. (Lindsay & Dhun 2015). The maximum fill depth was unlimited; the maximum breaching length was set to 1km; flat areas were incremented to 0.001°. The slope of the terrain was derived from the DEM according to Zevenbergen & Thorne (1987). Total catchment area (TCA) was also calculated on the basis of DEM. The Specific Catchment Area (SCA), defined as the upstream catchment area of a unit contour, was derived from TCA. Finally, combining slope and specific catchment area, TWI was calculated on the basis of local slope (Kopecký et al. 2021).

5. **Vertical distance to channel network** was derived from the channel network coming from the flow accumulation raster. The flow accumulation was calculated first from pre-processed DEM (see TWI section). A top-down processing of cells in combination with multiple flow direction based on maximum downslope gradient (Qin et al. 2011) was used. The channel network was computed from the resulting flow accumulation grid. The starting threshold for the channel was arbitrarily set to 10,000 and the minimum channel length to 50 m, which generated an optimal channel network based on the valley bottoms. The channel network was used to interpolate the virtual altitude surface 'virtual ground water level', which was compared with the original elevation model. The difference between the two was the resulting raster of vertical distances to the channel network (virtual ground water level).