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# The Last Glacial Maximum and Heinrich Event I on the Iberian Peninsula: A regional climate modelling study for understanding human settlement patterns

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The dating and spatial distribution of archaeological sites on the Iberian Peninsula (IP) suggest a poor occupation of the Southern IP by hunter-gatherers after the Last Glacial Maximum (LGM) and during Heinrich event 1 (H1) compared to Northern Iberia. The H1 was a period of cold and arid climate conditions and is assumed to have played an important role in the population dynamics in Europe at the end of the Pleistocene. In this study, the potential influence of climate change on the human settlement patterns on the IP is analysed based on regional paleoclimate modelling. The WRF model is used to simulate continuous time slices of 30 years of climate conditions representative for both the LGM and H1 at high spatial resolution (12.5 km). The model results indicate that, apart from a general decrease in temperature, a considerable decrease in precipitation over the southern IP occurred during the H1, that agrees with the available climate proxy data. The analysis of ombrotypes unveils extremely arid conditions, particularly over the southern IP and during the growing season (summer), which could have constrained the availability of food and water to the inhabitants. The total area on the IP that can be characterized as ultrahyperarid in summer enlarged from 2% (13K km2) during the LGM to 22% (148K km2) during the H1. Thus, the changed climate conditions between the LGM and H1 probably played a major role in the decrease of the hunter-gatherer populations in the Southern IP.