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# Investigating relationships between technological variability and ecology: the case of the Middle Gravettian (ca. 32-28 ky cal. BP) in France.

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## Résumé

A recurrent hypothesis in archaeology links material culture variability to their environmental contexts. Over the past decade, the application of Ecological Niche Modeling (ENM) to archaeological data has provided quantitative evaluations of such hypotheses. The French Middle Gravettian represents an ideal case study. Associated with the cold and dry environments of GS-5.2 and 5.1, a period marked by Heinrich Event 3 (*ca.* 30–29 ka cal. BP), this sub-phase of the Gravettian is characterized by two lithic typo-technical traditions: the Noaillian and the Rayssian, with the latter likely associated with HE3.

The two traditions have partially overlapping geographic distributions: the Noaillian is observed in regions south of the Loire River and the Rayssian is observed in regions that extend north from the Garonne River into more northern territories. However, their chronological relationships to one another are still unclear and the interpretation of their association at many sites within the region of overlap is not yet consensual. Nonetheless, the absence of the Rayssian south of the Garonne River suggests that this geographic feature may have separated the two cultural trajectories.

We critically evaluate published data in order to construct inventories of Noaillian and Rayssian archaeological sites, based on diagnostic typo-technological criteria. Using ENM methods, we estimate the ecological niches associated with the Middle Gravettian north (Noaillian + Rayssian) and south (Noaillian) of the Garonne River, which are then quantitatively evaluated and compared. Results demonstrate that, despite a large degree of overlap, the niches are significantly different from one another in both geographic and environmental dimensions. The fact that the niche associated with the Middle Gravettian north of the Garonne River is much broader than that of the Noaillian south of the Garonne River, suggests that the development of the Rayssian reflects the exploitation of a significantly expanded ecological niche during HE3.

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