

Archaeologists find clues to Neanderthal extinction

16 January 2012, By Carol Hughes

(PhysOrg.com) -- Computational modeling that examines evidence of how hominin groups evolved culturally and biologically in response to climate change during the last Ice Age also bears new insights into the extinction of Neanderthals. Details of the complex modeling experiments conducted at Arizona State University and the University of Colorado Denver were published in the December issue of the journal *Human Ecology*.

"To better understand [human ecology](#), and especially how human culture and biology co-evolved among hunter-gatherers in the Late Pleistocene of Western Eurasia (ca. 128,000-11,500 years ago) we designed theoretical and methodological frameworks that incorporated feedback across three evolutionary systems: biological, cultural and environmental," said Michael Barton, a pioneer in the area of archaeological applications of [computational modeling](#) at ASU.

"One scientifically interesting result of this research, which studied culturally and environmentally driven changes in land-use behaviors, is that it shows how [Neanderthals](#) could have disappeared not because they were somehow less fit than all other hominins who existed during the last glaciation, but because they were as behaviorally sophisticated as [modern humans](#)," said Barton, who is lead author of the published findings.

The paper "Modeling Human Ecodynamics and Biocultural Interactions in the Late Pleistocene of Western Eurasia" is co-authored by Julien Riel-Salvatore, an assistant professor of anthropology at the University of Colorado Denver; John Martin "Marty" Anderies, an associate professor of computational social science at ASU in the School of Human Evolution and Social Change and the School of Sustainability; and Gabriel Popescu, an anthropology doctoral student in the School of Human Evolution and Social Change at ASU.

"It's been long believed that Neanderthals were outcompeted by fitter modern humans and they could not adapt," said Riel-Salvatore. "We are changing the main narrative. Neanderthals were just as adaptable and in many ways, simply victims of their own success."

The interdisciplinary team of researchers used archeological data to track behavioral changes in Western Eurasia over a period of 100,000 years and showed that human mobility increased over time, probably in response to environmental change. According to Barton, the [last Ice Age](#) saw hunter-gatherers, including both Neanderthals and the ancestors of modern humans, range more widely across Eurasia searching for food during a major shift in the Earth's climate.

The scientists utilized computer modeling to explore the evolutionary consequences of those changes, including how changes in the movements of Neanderthals and modern humans caused them to interact - and interbreed - more often.

According to Riel-Salvatore, the study offered further evidence that Neanderthals were more flexible and resourceful than previously assumed.

"Neanderthals had proven that they could roll with the punches and when they met the more numerous modern humans, they adapted again," Riel-Salvatore said. "But modern humans probably saw the Neanderthals as possible mates. As a result, over time, the Neanderthals died out as a physically recognizable population."

Provided by Arizona State University

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