

'Ghost' footprints from Pleistocene era revealed by radar tech

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The researchers collecting GPR data at White Sands National Monument in New Mexico. Credit: Cornell University

Invisible footprints hiding since the end of the last ice age—and what lies beneath them—have been discovered by Cornell University researchers using a special type of radar in a novel way.

The <u>fossilized footprints</u> reveal a wealth of information about how



humans and animals moved and interacted with each other 12,000 years ago.

"We never thought to look under footprints," said Thomas Urban, research scientist at Cornell and lead author on the study. "But it turns out that the sediment itself has a memory that records the effects of the animal's weight and momentum in a beautiful way. It gives us a way to understand the biomechanics of extinct fauna that we never had before."

The researchers examined the footprints of humans, mammoths and giant sloths in the White Sands National Monument in New Mexico. Using ground-penetrating radar (GPR), they were able to resolve 96% of the human tracks in the area under investigation, as well as all of the larger vertebrate tracks.

"But there are bigger implications than just this case study," Urban said. "The technique could possibly be applied to many other fossilized footprint sites around the world, potentially including those of dinosaurs. We have already successfully tested the method more broadly at multiple locations within White Sands."

While these "ghost" footprints can become invisible for a short time after rain and when conditions are just right, "now, using geophysics methods, they can be recorded, traced and investigated in 3-D to reveal Pleistocene animal and <u>human interactions</u>, history and mechanics in genuinely exciting new ways," said co-author Sturt Manning, archaeology professor.

GPR is a nondestructive method that allows researchers to access hidden information without the need for excavation. The sensor—a kind of antenna—is dragged over the surface, sending a radio wave into the ground. The signal that bounces back gives a picture of what's under the surface.



In addition to this biomechanical treasure trove of data, the GPR technique gives researchers a way to learn about what <u>early humans</u> did when they were not at a campsite or kill site, the two types of archaeological sites best known for this <u>time period</u>.

The study, "3-D Radar Imaging Unlocks the Untapped Behavioral and Biomechanical Archive of Pleistocene Ghost Track," published in *Scientific Reports*.

More information: Thomas M. Urban et al, 3-D radar imaging unlocks the untapped behavioral and biomechanical archive of Pleistocene ghost tracks, *Scientific Reports* (2019). DOI: 10.1038/s41598-019-52996-8

Provided by Cornell University

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