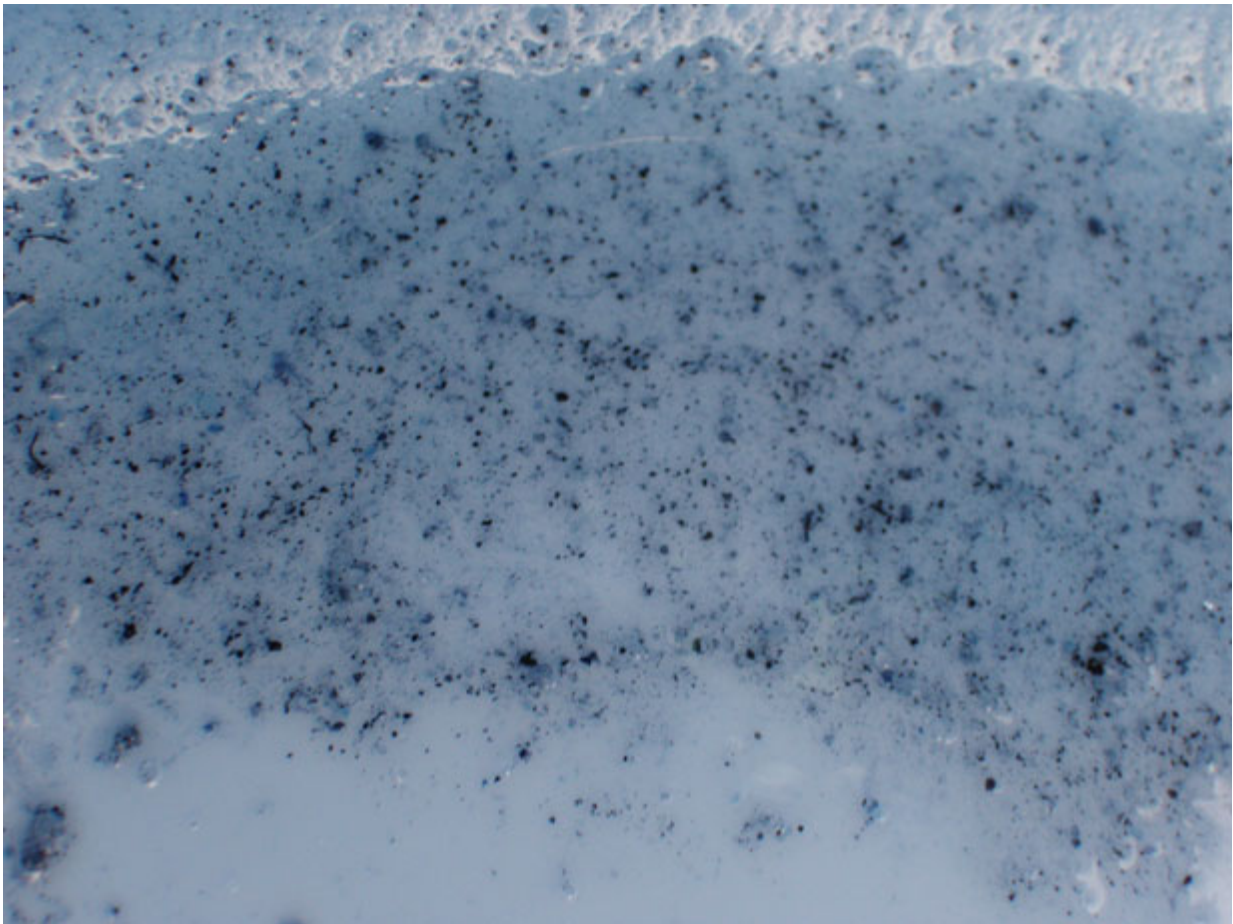


# Researchers can trace dust samples using fungal DNA

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Credit: public domain

Researchers from North Carolina State University and the University of

Colorado, Boulder, have developed a statistical model that allows them to tell where a dust sample came from within the continental United States based on the DNA of fungi found in the sample.

The primary goal of the research was to develop a new forensic biology tool for [law enforcement](#) or archaeologists. "But it may also give us a greater understanding of the invisible ecosystems of microbial life that we know are all around us, but that we don't fully comprehend," says Neal Grantham, a Ph.D. student in statistics at NC State and lead author of a paper on the work.

The researchers developed the model using data from the Wild Life of Our Homes [citizen science project](#) conducted by the Your Wild Life lab based at NC State. The project collected dust samples from approximately 1,000 homes across the continental U.S., including samples from 47 of the 48 contiguous states.

The goal of that project was to test the dust samples for DNA to identify the microbial species present in and around our homes. One of the things the project found was that the types of fungus - or fungal taxa - varied widely from region to region.

"Based on that finding, we wanted to determine if you could predict where a dust sample came from based on the fungi present in the sample, and - most of the time - we can," Grantham says.

The researchers developed a model that analyzed the fungal taxa present in a dust sample and predicted where the sample came from. About 5 percent of the time, the model's predictions were within 35 miles of the correct sampling site. Those were the most accurate predictions. The worst 5 percent were off by at least 645 miles. The model's median prediction error was 143 miles. However, the research team is already working to make the model more accurate by developing more advanced

algorithms.

"The work we've done so far was to determine whether this concept was viable," Grantham says. "Now that we know it is viable, we're developing statistical methods that are better suited to the problem.

"Ultimately, we want to have an online tool for law enforcement to run the results of [dust samples](#) taken from a piece of clothing, a body, or a vehicle, and get information on where the clothing, body, or vehicle has been," Grantham says.

**More information:** The paper, "Fungi Identify the Geographic Origin of Dust Samples," was published online in the journal *PLOS ONE* on April 13, 2015.

Provided by North Carolina State University

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