

Team discovers that wind moves microinvertebrates across desert

March 13 2018



Jose A. Rivas, a doctoral candidate in The University of Texas at El Paso's Ecology and Evolutionary Biology program, looks through a microscope at a sample of rehydrated dust containing microinvertebrates. The dust was collected from trays on the roof of the Biology Building on campus. Rivas is part of a team of UTEP faculty and staff who published the first evidence of how wind moves waterborne microinvertebrates across vast expanses of arid desert. Credit: UTEP Communications

The work of faculty and students from The University of Texas at El Paso (UTEP) has yielded the first evidence of how waterborne microinvertebrates move across vast expanses of arid desert.

An article published March 13, 2018 in *Limnology and Oceanography Letters*, a publication of the Association for the Sciences of Limnology and Oceanography, details for the first time how high desert winds disperse small invertebrates and how they colonize hydrologically disconnected basins throughout the region.

"These novel findings might have large implications for freshwater systems," said Elizabeth J. Walsh, Ph.D., professor in UTEP's Department of Biological Sciences and director of the doctoral program in Ecology and Evolutionary Biology. "As climate changes and water patterns shift, our work might help others understand the intricacies of the wind-aided dispersal of freshwater organisms. It's important because these organisms are the base of the food web. How they move will affect the movement of the biological communities that are built up around them."

Walsh added that the impetus for the research grew out of a previous five-year study of Chihuahuan Desert aquatic environments funded by the National Science Foundation. Part of that project involved characterizing the biodiversity of microinvertebrates at 300 sites. Researchers wanted to better understand how organisms were colonizing these bodies of water that were separated by vast distances of desert and not tied together by hydrological links such as drainage routes.

"If they weren't being moved by water, and they weren't being moved by other animals, then the next thing we thought is, 'It has to be the wind,'" Walsh said.



A tray of marbles sits on the roof of the Biology Building on the campus of The University of Texas at El Paso. Trays like this were used to collect dust as part of a study by UTEP faculty and students to determine how microinvertebrates were carried across vast expanses of desert by wind. The marbles mimic the rolling surface of desert terrain. Blowing dust skims right over most surfaces but will occasionally become lodged in gaps. Researchers took this dust and rehydrated it to determine if microinvertebrates in dormant, developmental stages were present. Credit: UTEP Communications

Enter Thomas E. Gill, Ph.D., UTEP professor in the Department of Geological Sciences and Environmental Science and Engineering Program, who while conducting concurrent studies on Chihuahuan Desert wind storms, pondered, "What kinds of living things are being carried along with the dust?"

What followed was a multi-year interdisciplinary research effort that collected dust samples; confirming those samples contained microinvertebrates in dormant, developmental stages; rehydrating them in laboratory settings; and utilizing next-generation sequencing to determine which organisms were present in the dust.

The last step involved moving the dust through a simulated storm to determine if the organisms could survive being blasted through the air across lengthy distances. Doctoral student Jose A. Rivas Jr. and Gill worked with Scott Van Pelt, Ph.D., a soil [science](#) researcher with the U.S. Department of Agriculture, to conduct such a test at the USDA Agricultural Research Service's wind tunnel facility in Big Spring, Texas.

"We basically simulated a wind storm," Gill said. "We took the clean desert soil, in which we mixed microinvertebrates, and blew it into the air. After this energetic, turbulent journey through the wind tunnel, our team showed that those organisms, which are about the size of grains of sand in their dormant stage in their development, survived getting sandblasted into the air. They can fly through the atmosphere, maybe hundreds of miles in viable conditions, and still wake up."

Gill said the group's findings will help inspire further research on the movement of [organisms](#). He added that the effort that took place at UTEP was a successful collaboration because of support from the UTEP Interdisciplinary Research (IDR) program, the National Institutes of Health, the National Science Foundation and the National Oceanic and Atmospheric Administration Center for Atmospheric Sciences (NCAS). He also said the work conducted by doctoral students Rivas and Jon Mohl - who served as the study's lead and second authors - was vital to the effort.

"It's a very exciting and unique project," said Rivas, who was the study's lead author. "Dust storms are a huge part of the Southwest. We interact

with them every spring. What's interesting is not only learning about [dust storms](#) but finding out what exactly is being transported, what's in the dust? This is especially important in understanding the diversity of our Chihuahuan Desert ecosystem. Learning how small, aquatic animals are transported and colonize new areas will lead to insights into how communities in tem

More information: *Limnology and Oceanography Letters*, [DOI: 10.1002/lo12.10072](#) , [onlinelibrary.wiley.com/doi/10 ... 1002/lo12.10072/full](#)

Provided by The University of Texas at El Paso

Citation: Team discovers that wind moves microinvertebrates across desert (2018, March 13) retrieved 25 April 2024 from <https://phys.org/news/2018-03-team-microinvertebrates.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.