



Tyler Prize

FOR ENVIRONMENTAL ACHIEVEMENT

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Antarctic Soil Researcher Awarded Prestigious 2013 Tyler Environmental Prize

***Diana H. Wall, PhD, recognized for her work on the important role of soil biodiversity in
climate change, ecosystems and human life***

Tyler Prize for Environmental Achievement Celebrates Its 40th Anniversary

Los Angeles, CA (March 17, 2013) – The Tyler Prize for Environmental Achievement today named Diana H. Wall, PhD, of Colorado State University the recipient of the 2013 Tyler Prize for her research documenting and exploring the complex and fragile soil ecosystem. Her research – extending from more than 20 years in Antarctica’s deserts, to the plains of Kansas and New York City’s Central Park – has explored the dynamics of species like nematodes, small worm-like organisms, living in the soil and their impact on life above ground. Wall’s work in the Antarctic continues to demonstrate the critical links between climate change and soil.

Wall’s research has shown that changes in climate can fundamentally alter the ecology of soil life. This, in turn, changes the way that soil is able to transfer and store carbon from sources such as plant roots and decaying organic matter. When soil holds more organic carbon, less carbon dioxide, a driver of climate change is released into the atmosphere. This cycle of plant uptake and breakdown of carbon impacts the rate of climate change.

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“I hope winning the Tyler Prize helps bring awareness that soil is more than dirt that feeds our crops, it also plays a major role in storing carbon globally,” said Wall, a University Distinguished Professor, Professor of Biology, and Director of the School of Global Environmental Sustainability. “We’ve learned that there is an astonishing amount of life hidden underground that is critical to sustaining our planet. It is an amazing honor to receive this prestigious award and have the research results generated by my lab, students and collaborators, recognized in this way.”

Since its inception 40 years ago as one of the world’s first international environmental awards, the Tyler Prize has been the premier award for environmental science, environmental health and energy.

“Just as we came to understand the importance of preserving our oceans and air, Diana Wall has helped move the global community to recognize the incredible importance of the biodiversity of our soil,” said Tyler Prize Executive Committee Chair Owen T. Lind, Professor of

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University of Southern California

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Biology at Baylor University. “Her work shows us the delicate balance that exists under our feet and the impact climate change will have on soil and our quality of life.”

As the winner of the Tyler Prize, Wall will receive a \$200,000 cash prize and a gold medal. The Prize, awarded by the international Tyler Prize Executive Committee with the administrative support of the University of Southern California, honors exceptional foresight and dedication in the environmental sciences – qualities that mirror the prescience of the Prize’s founders, John and Alice Tyler, who established it while the environmental debate was still in its infancy.

Previous laureates include Edward O. Wilson, recognized for his early work on the theory of island biogeography; Jane Goodall, selected for her seminal studies on the behavior and ecology of chimpanzees and her impact on wildlife awareness and environmental conservation; Jared Diamond, a renowned author who gave birth to the discipline of conservation biology; and Thomas Lovejoy, a central figure in alerting the world to the critical problem of dwindling tropical forests. A full list of past winners is available at <http://tylerprize.usc.edu/pastlaureates.html>.

Governments Turn Their Attention to Soil

Wall’s research places her at the center of policy efforts to protect soil and address climate change. Efforts in the European Union and the United States, along with other regions, to protect soil in the face of urbanization have been largely informed by the work of Wall and her colleagues. Governments and international organizations increasingly see soil as a frontline of climate change, in addition to being central to sustainable agriculture. Degradation of soil and land is playing an increasingly large role in discussions at the United Nations Framework Convention on Climate Change, the UN Convention to Combat Desertification, and the UN Convention on Biological Diversity.

“We know that we’ve got extensive soil problems globally,” said Wall. “From the increasing spread of deserts, to decreasing soil fertility, to more frequent and severe droughts, we have things happening to land that affect the species that live in soil and the ability of that soil to help sustain plant life, purify water and store carbon.”

“Soil ecology and its essential biodiversity is just now beginning to get the level of attention that the oceans, rivers, lakes and wetlands receive when it comes to protecting our environment,” said Wall. “This is the new frontier of climate change and environmental preservation.”



Members of Wall’s research team study the impacts of temperature and moisture on soil animals in the Antarctic (top) and Noah Fierer, a collaborator at the University of Colorado, samples soil to measure how many species live in NYC’s Central Park (lower).

Photo Credit: Byron Adams (top) and Diana Wall (lower)

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Analyzing Soil: From Antarctica to Central Park

Wall's career started in horse country Kentucky where she worked a summer analyzing parasites infecting horses. After an offer to study soil nematodes, Wall moved into the study of plant pathology. From there, her research took her south to the Dry Valleys of Antarctica. It was here that she was first able to study all the animal species living in soil and their relationships in a less complex ecosystem.

"I can see two to three animal species in the soils of Antarctica and 250 in a handful of soil elsewhere," said Wall. "By working in an isolated and extreme environment like Antarctica, without people and plants, we can study what happens when we make very specific changes to moisture or temperature to better understand soil ecology and the importance of individual species."

Lessons learned over more than 20 years in cold deserts like the Dry Valley have been applied to the hot, dry climates of deserts like the Sahara.

Today, Wall's work now spans the globe to include projects in Africa, the grasslands of Kansas, and, most recently, New York City's Central Park.

Working with colleagues around the world, Wall plans – for the first time – to map the biodiversity in soils and relate it to above-ground diversity to examine what connections exist.

"We assume that if we're in the Amazon and we have great biodiversity above ground, we're going to have great biodiversity below-ground. But that isn't necessarily so," explained Wall. "This will help us to identify the hotspots of biological diversity so we can be savvy about agriculture, development and habitat restoration."

Changing Soil and Changing Climate

Wall's work has shown that slight changes to temperature or moisture of soil can have dramatic impacts on relationships between species in soil – even to the point of altering which bacteria or invertebrates dominate soil ecosystems. These shifts, she explains, have far-reaching reverberations in all climates.

"The soil of the prairies of Kansas, for example, will be fundamentally altered by climate change and that will most likely mean that different types of plants will grow there," said Wall. "In turn, these new types of plants will further change life in soil. This process isn't limited to Kansas; it will happen everywhere."

Changes in the community of organisms living in soil also affect how carbon is transferred and stored in the environment. Invertebrates and bacteria are responsible for processing and collecting carbon from the environment from sources like dead leaves and plant roots and making nutrients available for plants. Soil stores more carbon than the air and trees combined, but when the balance of invertebrates and bacteria in soil is altered, the ability to store carbon is disrupted.

"Climate change drives soil change and soil change drives climate change," explained Wall. "These issues are deeply intertwined and research must look at climate and soil biodiversity together."

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Lecture and Award Ceremony

On Wednesday, April 17, at 1:30pm, Wall will deliver a public lecture on her work at the American Association for the Advancement of Science.

And in a private ceremony, on Wednesday, April 17, at 7pm, the Tyler Prize Executive Committee and the international environmental community will honor Wall at a banquet and ceremony at The Willard InterContinental in Washington, DC.

About the Tyler Prize

The Tyler Prize for Environmental Achievement is one of the first international premier awards for environmental science, environmental health and energy.

It was established by the late John and Alice Tyler in 1973 and has been awarded annually to sixty-one individuals and four organizations associated with world-class environmental accomplishments. Recipients encompass the spectrum of environmental concerns including environmental policy, health, air and water pollution, ecosystem disruption and loss of biodiversity, and energy resources.

For more information on the Tyler Prize and its recipients, go to:

<http://www.tylerprize.usc.edu/laureates.html>