

Press Release 13-170

In race against time, NSF grants fund research on Earth's threatened biodiversity

NSF Dimensions of Biodiversity program announces 13 new awards



Yellowstone's hot springs will be sampled in an NSF Dimensions of Biodiversity project.
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The diversity of life on Earth is seemingly endless, yet much still remains to be discovered. With climate change and habitat loss threatening that biodiversity, the challenge of discovery is a race against time.

To fill the gaps in understanding our planet's biodiversity, the National Science Foundation (NSF) has awarded 13 grants totaling \$25 million in the fourth year of its Dimensions of Biodiversity program.

Dimensions of Biodiversity is part of NSF's Science, Engineering and Education for Sustainability investment.

Centuries of biological research have established a strong foundation for our understanding of biodiversity.

In the past, however, researchers have sought to understand a single dimension of biodiversity-- the diversity of species at the genetic level, species diversity in a taxonomic group, or the diversity of roles certain species play in an ecosystem.

Scientists funded by the Dimensions of Biodiversity program, however, integrate genetic, taxonomic, and functional approaches in their study and exploration.

The Dimensions of Biodiversity awards are supported by NSF's Directorates for Biological Sciences and Geosciences along with NASA, which co-funds projects that use state-of-the-art remote sensing technologies.

Collaborative projects between U.S. and Chinese, and U.S. and Brazilian researchers are co-funded by the National Natural Science Foundation of China (NSFC) and the Sao Paulo Research Foundation (FAPESP), respectively.

"The resulting discoveries go beyond expanding our knowledge of the depth and breadth of life on Earth," says John Wingfield, NSF assistant director for Biological Sciences.

"This research has the potential to revolutionize the way we practice medicine, manage agriculture, address global climate change, and develop new technologies," Wingfield says.

"The synergy created by integrating recent technological advances with collaborations across disciplines and across continents allows these researchers to make significant progress in our understanding of biodiversity."

This year's Dimensions of Biodiversity awardees will study subjects such as: the biota of the critically endangered Brazilian Atlantic forest; microbes living in deep shale deposits; the adaptive radiation of bird lice; the diversity of gut flora in herbivorous woodrats; interactions between floral scents and pollinators; and succession in forests of the Thousand Island lakes area in China.

Grantees will also conduct research on diversification in *Adelpha* butterflies; nutrient cycling in bivalves' symbiotic organisms; ocean bacteria that help regulate sulfur emissions into the atmosphere; remote sensing technology as a tool for understanding plant and microbial biodiversity; the co-existence of diverse clover species and nitrogen-fixing bacteria; drought tolerance in grasses; and host-viral interactions in hot springs.

2013 NSF Dimensions of Biodiversity Awards:

Mary Ann Moran, University of Georgia, [Dimensions: Bacterial taxa that control sulfur flux from the ocean to the atmosphere](#)

Additional Collaborators: William Whitman, University of Georgia, James Birch and Christopher Scholin, Monterey Bay Aquarium Research Institute, and Ronald Kiene, University of South Alabama

Sharon Strauss, University of California Davis, [Dimensions: Symbiont and transcriptomic niche dimensions of long-term coexistence in trifolium communities](#)

Additional Collaborators: Maren Friesen, Michigan State University

Mark Young, Montana State University, [Dimensions: Costs and benefits of chronic viral infections in natural ecosystems](#)

Additional Collaborators: Joshua Weitz, Georgia Institute of Technology; Rachel Whitaker, University of Illinois at Urbana-Champaign

Joseph Craine, Kansas State University, [Dimensions: The biogeography and evolution of drought tolerance in grasses \(Co-funded with NASA\)](#)

Additional Collaborators: Lynn Clark, Iowa State University; Jesse Nippert and Mark Ungerer, Kansas State University, Melvin Duvall, Northern Illinois University, and Christopher Still, Oregon State University

Jeannine Cavender-Bares, University of Minnesota Twin Cities, [Dimensions: Linking remotely sensed optical diversity to genetic, phylogenetic and functional diversity to predict ecosystem processes \(Co-funded with NASA\)](#)

Additional Collaborators: Sarah Hobbie and Rebecca Montgomery, University of Minnesota Twin Cities, Michael Madritch, Appalachian State University, Philip Townsend and Richard Lindroth, University of Wisconsin Madison, and Arthur Zyguelbaum and John Gamon, University of Nebraska Lincoln

Ana Carnaval, CUNY City College, [Dimensions: A multidisciplinary framework for biodiversity prediction in the Brazilian Atlantic forest hotspot \(Co-funded with NASA and FAPESP\)](#)

Additional Collaborators: Michael Hickerson and Kyle McDonald, CUNY City College, Fabian Michelangeli and William Thomas, New York Botanical Garden; Cristina Myiaki, University of Sao Paulo

Dale Clayton, University of Utah, [Dimensions: Experimental adaptive radiation--genomics of diversification in bird lice](#)

Additional Collaborators: Sarah Bush and Michael Shapiro, University of Utah, Kevin Johnson University of Illinois Urbana-Champaign

Annette Engel, University of Tennessee Knoxville, [Dimensions: Functional diversity of chemosymbiosis in lucinid bivalves from coastal biomes](#)

Additional Collaborators: Laurie Anderson, South Dakota School of Mines and Technology, Barbara Campbell, Clemson University

Denise Dearing, University of Utah, [Dimensions: Biodiversity of the gut microbiome of herbivorous rodents](#)

Additional Collaborators: Colin Dale and Robert Weiss, University of Utah

Sean Mullen, Boston University, [Dimensions: Connecting the proximate mechanisms responsible for organismal diversity to the ultimate causes of latitudinal gradients in species richness](#)

Additional Collaborators: Ryan Hill, University of the Pacific, Marcus Kronforst, University of Chicago, Keith Willmott, University of Florida, Adriana Briscoe, University of California Irvine

Paula Mouser, Ohio State University, [Dimensions: Microbial biodiversity and functionality in deep shale and its interfaces \(DSIs\)](#)

Additional Collaborators: David Cole, Michael Wilkins, and Kelly Wrighton, Ohio State University, and Shikha Sharma, West Virginia University

Lin Jiang, Georgia Institute of Technology, [Dimensions: Phylogenetic, functional, and genetic diversity and ecosystem functions in a fragmented landscape \(Co-funded by the NSFC\)](#)

Additional Collaborators: Jianguo Wu, Arizona State University; Mingjian Yu, Zhejiang University

Krissa Skogen, Chicago Botanic Garden, [Dimensions: Scent-mediated diversification of flowers and moths across western North America](#)

Additional Collaborators: Jeremie Fant and Norman Wickett, Chicago Botanic Garden, Rachel Levin, Amherst College, Robert Raguso, Cornell University

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