

# Scientists explore the role of aeroecology in bat conservation and ecosystem health

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Golf courses and coffee plantations are some of the unlikely bat habitats that could be considered in conservation plans, say scientists presenting research at the Ecological Society of America's (ESA) 96th Annual Meeting from August 7-12, 2011. Using Doppler weather radar and other technologies relatively new to the field of ecology, ecologists will discuss the role of atmospheric conditions in bat behavior and the effectiveness of acoustic deterrents in reducing bat fatalities at wind farms. ESA's August 2011 meeting will take place in Austin, Texas, home to North America's largest urban bat colony. Here is just some of the research on bat conservation, bat and ecosystem health and aeroecology to be presented at the meeting:

## **Golf courses for bat conservation**

[Golf courses](#) could be home to threatened [bat populations](#) throughout the U.S. Delmarva Peninsula along the East Coast, according to Megan Wallrichs and Kevina Vulinec from Delaware State University. The researchers, who will be presenting at the Austin meeting, used ultrasonic detectors to monitor the acoustics of microhabitats—such as water hazards and forested patches—in Delmarva golf courses and identified six species of bats. They found that water hazards could serve as foraging sites for bats while forest patches could offer suitable roosting habitats.

"Golf courses have traditionally been viewed as environmental problem

areas," said Wallrichs. "However, the landscape seems to be a natural draw for roosting bats. Our research shows a possible advantage to golf courses, providing bats with a habitat and golf courses with pest control."

The presentation "Golf courses: An innovative opportunity for bat conservation," led by Megan Wallrichs, Delaware State University, will be held Tuesday, August 9, 2011 at 10:30 am during the "Conserving Bats to Ensure a Healthy Planet" organized oral session.

Other presentations on bat conservation include: "Bats, bugs and pecans: The role of insectivorous bats in a pecan agroecosystem in central Texas" led by Elizabeth Braun de Torrez, Boston University; "Evaluating the relationship between knowledge of and attitudes towards bats" led by Jessica Sewald, Bowling Green State University; and "Continent-wide conservation actions in the most bat speciose area in the world: the next 20 years" by Rodrigo Medellín, Arizona-Sonora Desert Museum and Instituto de Ecología, Universidad Nacional Autónoma de México.

## **Pest control in shade coffee plantations**

According to Kimberly Williams-Guillén from the University of Washington, bats provide a vital service to shade grown coffee plantations: pest control. After analyzing coffee plantations in southern Mexico with acoustic monitoring and DNA testing among other techniques, Williams-Guillén found that several bat species were reducing pests. The research, which will be presented at ESA's 2011 Annual Meeting, shows that, when bats were excluded from accessing the area, there was an 84% increase in arthropod numbers on coffee plants.

The presentation "Ecosystem services of neotropical insectivorous bats in a highly diverse tropical agroforestry system," by Kimberly Williams-Guillén, University of Washington, will be held Tuesday, August 9, 2011

at 8:20 am during the "Conserving Bats to Ensure a Healthy Planet" organized oral session.

Other presentations on bat and [ecosystem health](#) include: "Emerging diseases and bats: Implications for conservation and ecosystem health" led by Amy Turmelle, Centers for Disease Control and Prevention, Atlanta; "Roost characteristics and thermal competition in bats in a high-temperature cave" led by Christopher Nicolay, University of North Carolina, Asheville; "Foraging energetics and the redistribution of nutrients by Brazilian free-tailed bats" led by Lauren Gonzalez, Boston University; and "Connectivity and the spread of infectious diseases in wildlife" led by Raina Plowright, Pennsylvania State University.

## **Tracking bats and their prey in the aerosphere**

Using Doppler weather radar, Winifred Frick from the University of California, Santa Cruz, and colleagues explored the role of [atmospheric conditions](#) and insect prey presence in bat behavior. Specifically, the researchers used weather tracking technology to determine the regional patterns of migratory arrival and departure times of Brazilian free-tailed bats in Texas. They also found that weather conditions—such as surface temperature, precipitation and wind—played a significant role in when these bats emerged from caves and from under bridges in Texas.

"For quite some time, the flight and foraging behavior of nocturnal aerial animals has been difficult to track," said Frick, who will be presenting this research with colleagues at ESA's 2011 Annual Meeting in Austin. "Now we are able to study radar visualizations to observe animal behavior while they interact in the aerosphere."

The presentation "Meteorological drivers of predator-prey interactions in the aerosphere" led by Winifred Frick, University of California, Santa Cruz, will be held Thursday, August 11, 2011 at 2:30 pm during the

"Aeroecology: An Emerging Discipline" organized oral session.

Other presentations on aeroecology include:

"Impacts of wind-energy development on bats: Challenges and solutions" by Edward Arnett, Bat Conservation International, Austin; "Large-scale navigational map in a flying mammal: Evidence from GPS tracking of Egyptian fruit bats" led by Nachum Ulanovsky, Weizmann Institute of Science, Rehovot, Israel; "Radar aeroecology: The need for cohesive radar studies of organisms in the aerosphere" led by Phillip Chilson, University of Oklahoma; and "Integrating novel technologies to understand the flight behavior of [bats](#) at different temporal and spatial scales" led by Nickolay Hristov, Winston-Salem State University.

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