

Urban insects are more resilient in extreme weather

January 11 2018, by Jeanne Leong



Amy Savage searches New York City medians for ants as cars pass by. Credit: Lauren Nichols

A study led by Amy Savage, a Rutgers University-Camden assistant

professor of biology, will help researchers understand how to make predictions and conservation decisions about how organisms living in cities will respond to catastrophic weather events.

Savage's analysis, conducted in New York City, compared the diversity of arthropods - insects such as ants, bees, beetles, and wasps - that were living in parks and street medians before and after Hurricane Sandy, which ravaged parts of New Jersey and New York in 2012.

The study, "Homogenizing an Urban Habitat Mosaic: Arthropod diversity declines in New York City parks after Super Storm Sandy," was published in the journal *Ecological Applications*.

The study shows that before the [storm](#), the diversity was higher in the parks than in street medians. After the storm, arthropod diversity in the parks declined, resulting in communities in parks becoming indistinguishable from those in street medians. In other words, the higher diversity detected in parks before the storm was absent from post-storm samples.

According to the Rutgers-Camden researcher, the study supports the hypothesis that organisms living in high-stress urban medians possess adaptations to disturbance, making them more resilient to the effects of extreme [weather](#) events than organisms living in relatively low-stress city parks.

Researchers found that the arthropods that were most vulnerable to flooding were the same groups that were most sensitive to chronic stress in medians compared with parks before the storm.

"These data suggest that one result of the increasing frequency and intensity of extreme weather events will be homogenization of diversity in cities and that the direction of this simplification of urban

communities may be quite predictable," says Savage. "It's very encouraging because it suggests that we may be able to make smart management decisions to mitigate the damaging effects of extreme weather events on urban ecosystems."

In August of 2012, Savage began studying how diversity differed across habitats with different levels of environmental stress. Two months later, Hurricane Sandy struck Manhattan. Savage's team of researchers began studying the post-Sandy effects in the spring of 2013.

"When the storm hit, we were in a unique position to study how these arthropod communities responded to extreme storms," says Savage. "Testing these contrasting hypotheses was an opportunity to not only help people understand and plan for diversity changes after extreme weather events, but also to provide important data that would move the field of ecology forward."

The research can be useful in future studies on how resilient urban ecosystems are to [extreme weather events](#).

"Between Hurricanes Harvey, Irma, and Maria, the 2017 Atlantic [hurricane](#) season underscores this point," says Savage. "We can now use our data from Manhattan after Super Storm Sandy to make predictions about how [diversity](#) may change in Houston after Hurricane Harvey and in the urban centers of Puerto Rico after Hurricanes Irma and Maria, among other areas affected by these storms."

More information: Amy M. Savage et al. Homogenizing an urban habitat mosaic: arthropod diversity declines in New York City parks after Super Storm Sandy, *Ecological Applications* (2017). [DOI: 10.1002/eap.1643](#)

Provided by Rutgers University

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