

Climate change alters cast of winter birds

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Over the past two decades, the resident communities of birds that attend eastern North America's backyard bird feeders in winter have quietly been remade, most likely as a result of a warming climate.

Writing this week in the journal *Global Change Biology*, University of Wisconsin-Madison wildlife biologists Benjamin Zuckerberg and Karine Princé document that once rare wintering [bird species](#) are now commonplace in the American Northeast.

Using more than two decades of data on 38 species of birds gathered by thousands of "citizen scientists" through the Cornell University Laboratory of Ornithology's Project FeederWatch, the Wisconsin researchers show that birds typically found in more southerly regions are gradually pushing north, restructuring the communities of birds that spend their winters in northern latitudes.

To the casual observer of backyard birds, the list of species becoming more common includes the readily familiar: cardinals, chipping sparrows and Carolina wrens. These birds and other warm-adapted species, according to Princé and Zuckerberg, have greatly expanded their wintering range in a warmer world, a change that may have untold consequences for North American ecosystems.

"Fifty years ago, cardinals were rare in the northeastern United States. Carolina wrens even more so," explains Zuckerberg, a UW-Madison assistant professor of forest and wildlife ecology.

An estimated 53 million Americans maintain feeding stations near their homes, according to the U.S. Fish and Wildlife Service, suggesting that increases in some species may be attributable to more readily available sources of food. However, that figure has remained constant, reflecting only a slight decline since 1991, indicating that environmental factors beyond the availability of food sources are at play.

The Wisconsin researchers measured the changes over time in the abundance of 38 bird species at feeders in eastern North America, specifically looking at the influence of changes in winter minimum temperature over a 22-year period on the flocks of birds that gather at backyard feeding stations.

"We conclude that a shifting winter climate has provided an opportunity for smaller, southerly distributed species to colonize new regions and promote the formation of unique winter bird assemblages throughout eastern North America," Princé and Zuckerberg write in their *Global Change Biology* report.

"People will likely start seeing new species in their backyards," says Princé, a UW-Madison postdoctoral fellow. "There can also be subtle changes in species abundance."

The changes in the mix of overwintering bird species is occurring against a backdrop of milder winters with less snow, more variable and intense precipitation events, and a shorter snow season, overall. Climate models predict even warmer temperatures occurring over the next 100 years, with seasonal climate effects being the most pronounced in northern regions of the world.

"We've been able to document in past studies that species are shifting in response to climate change," Zuckerberg says. "This study documents changes in the (winter bird) community structure. If you have a species

coming into a new area, it can modify the composition of the community."

In any ecosystem, Zuckerberg notes, removing or introducing even a single species can have a cascade of ecological consequences, many of them unknown.

"These backyard birds are the canaries in the coal mine," Zuckerberg says. "Birds have always been very good indicators of environmental change. Whenever you have a reshuffling of a community of [species](#), you have less of a sense of what change is going to be."

Princé notes that other environmental changes, such as the pervasive human impact on landscape, for example, may also be exerting an influence on the observed changes in the composition of [birds](#) attending winter feeding stations in eastern North America.

"Climate change should not be viewed as the sole driver of changes in winter bird communities, but this signal is a pretty strong one for [climate change](#)," she explains. "The changes we document are so broad in scope that anything that is occurring at a local level is swamped out by the scale of this analysis."

Provided by University of Wisconsin-Madison

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