

# Bigger birds in central California, courtesy of global climate change

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Birds are getting bigger in central California, and that was a big surprise for Rae Goodman and her colleagues.

Goodman uncovered the trend while working as a graduate student for San Francisco State University biologist Gretchen LeBuhn, analyzing data from thousands of birds caught and released each year at two sites near San Francisco Bay and the Point Reyes National Seashore.

The [SF State](#) scientists, working with researchers from PRBO Conservation Science and the San Francisco Bay Bird Observatory who collected the data, found that birds' wings have grown longer and birds are increasing in mass over the last 27 to 40 years.

What's making the birds bigger? The researchers think that the trend is due to climate change, but their findings put a twist in the usual thinking about climate change and [body size](#). A well-known ecological rule, called Bergmann's Rule, states that animals tend to be larger at [higher latitudes](#). One reason for this rule might be that larger animals conserve [body heat](#) better, allowing them to thrive in the generally colder climate of higher latitudes.

Under this reasoning, some scientists have predicted that animals would get smaller as the Earth has warmed up over the past 100 years. But the study, published in the journal [Global Change Biology](#), suggests that the connection may not be so simple.

Climate change may affect body size in a variety of ways, they note in their paper. For instance, birds might get bigger as they store more fat to ride out severe [weather events](#), which are expected to be more common under [global climate change](#). Climate change could also alter a region's plant growth, which may eventually lead to changes in a bird's diet that affect its size.

LeBuhn, an assistant professor of biology, said she was "completely surprised" to find that the central California birds were growing larger over time. "It's one of those moments where you ask, 'what's happening here?'" The results were so unexpected, she said, that the findings made them take a step back and look more closely at how climate change could influence body size.

The bird data come from two long-term "banding stations" in central California, where a wide variety of birds are captured, banded about the leg with an identification tag, and weighed and measured before being released. Many of the same birds were captured each year, allowing the researchers at the sites to build up a unique database that could be used to track changes among the birds over several decades.

The researchers used data from 14,735 individual birds collected from 1971 to 2010 at the Palomarin Field Station, near the southern end of the Point Reyes National Seashore, by researchers from PRBO Conservation Science. Their study also included data on 18,052 birds collected between 1983 and 2009, from the Coyote Creek Field Station at the southern end of the San Francisco Bay by the San Francisco Bay [Bird Observatory](#).

"At the time I started my research, a few studies had looked at body size changes in a few species in Europe and the Middle East, but no one had examined bird body size changes in North America," said Goodman, who now teaches Biology and Environmental Science at San Francisco's

Jewish Community High School of the Bay.

"We had the good fortune to find an unexpected result -- a gem in research science," she added. "But we were then left with the puzzle of figuring out what was going on."

After testing and discarding a number of other explanations, Goodman and her colleagues were confident that climate change was behind the longer wings and bigger bodies in most of the birds. The birds may be responding to climate-related changes in plant growth or increased climate variability in central California, the researchers suggest in the paper.

"The fingerprint of climate change is showing up in many of our ecosystems," explains Nat Seavy, research director for the Central Coast at PRBO [Conservation Science](#). "The challenge is to use the long-term data we've been collecting to understand how, where and why these changes are occurring."

The findings offer a glimpse at the potent effects of climate change across a wide range of species, LeBuhn said. "Even over a pretty short period of time, we've documented changes in important traits like body size, where we don't expect to see much flexibility."

"But in some ways," she added, "it gave me a little more hope that these [birds](#) are able to respond -- hopefully in time -- to changes in climate."

"Although it is encouraging that species are changing in response to [climate change](#)," said Seavy, "it is also troubling that environmental stressors are pushing and pulling on species in diverse ways...What will happen to our ecosystems as some species get larger and others get smaller? We need long-term monitoring to help us understand the impact of these changes."

**More information:** "Avian body size changes and climate change: warming or increasing variability?" appeared online Oct. 12, 2011, published by Global Change Biology. [onlinelibrary.wiley.com/doi/10 ... 86.2011.02538.x/full](https://onlinelibrary.wiley.com/doi/10.1111/gcb.12086)

Provided by San Francisco State University

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