As cicadas emerge four years early, scientists wonder if climate change is providing a nudge

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Cicadas overwhelm tree branches across the mid-Atlantic once every 17 years, like clockwork. But something - some suspect climate change - could be sounding their alarm clocks four years early.

In recent days, the red-eyed, nugget-shaped insects have been spotted crawling out from beneath trees from Northern Virginia to Bel Air, Md., in large - though not overwhelming - numbers.

The phenomenon is confusing entomologists who weren't expecting to see many of the screeching insects in the region until 2021.

Small numbers of cicadas can sometimes grow fast enough to emerge four years early. But there have been a thousand reports of cicadas up and down the Interstate 95 corridor in just the past two days, more than scientists expected.

Cicada lovers are wondering if the numerous reports are simply a sign of how easy the internet has made it to track the periodic rite of spring - or if climate change is nudging more cicadas to venture above ground early.

Scientists are asking residents to help them figure it out, using online reporting tools that didn't exist during earlier cicada cycles. They're collecting reports of cicada activity, which could continue for the next month, and also memories of how those conditions compare to past

cicada seasons.

The data could help scientists investigate what is, for now, just a hypothesis: That longer growing seasons linked to climate change may have shortened the life cycle of many 17-year cicadas, and could end up creating new cycles of timekeeping broods.

"You could see many more individuals coming out four years early, and eventually those could become so numerous that they're self-reproducing," said Chris Simon, a professor of ecology and evolutionary biology at the University of Connecticut.

Cicada swarms are impossible to miss when they arrive in earnest every 17 years, numbering in the billions or trillions, according to Mike Raupp, an entomologist at the University of Maryland, College Park.

A group known as Brood X last covered tree branches, and eventually sidewalks, across Maryland in 2004. A separate class, Brood VI, is currently blanketing parts of the Carolinas and Georgia.

Cicadas spend nearly all of their lives underground, feeding on tree roots. Scientists believe they have some sort of biological clock that counts the trees' annual cycles of growth and hibernation. Once it hits 13 or 17 years, they emerge to reproduce, then die within about a month.

It's thought the cycles give the cicadas a biological advantage, rarely lining up with cyclical peaks in the numbers of their predators.

But scientists say there are always small subsets of the 17-year cicada broods that don't wait the full cycle before emerging. Scientists think cicadas "count" in fours, and if they are big enough after 13 years, some crawl out sooner.

It's possible that climate change is helping more of them to grow faster, Simon said.

"If the conditions are really good, then a lot of them will come out," she said. "The longer the growing season, the higher the chance that a very large number will be ready four years early."

Entomologists began crowdsourcing cicada sightings from across the country about a decade ago at magicicada.org - a site whose name references periodical cicadas' biological genus. The reports provide richly detailed data points mapping the density and breadth of 15 distinct cicada broods across the eastern United States.

But this is the first chance they have to so closely monitor the infamous Brood X, which ascends on Maryland and 14 other states, as well as Washington. The last time any members of that brood emerged early was in 2000, so data is more anecdotal and localized.

Gene Kritsky, an entomologist at Mount St. Joseph University in Cincinnati, said he observed about 10 percent as many cicadas that year as emerged four years later in 2004. He said he plans to compare what he sees in southeastern Ohio this year to his records from 2000, and also to look to reports from across the country to determine if changes might be occurring in the cicada cycles.

It's still early in the season to get a good gauge of the insects' numbers. They don't emerge until soil reaches 64 degrees, so entomologists expect more to come out as temperatures surge into the 80s and possibly 90s this week.

Kritsky said while evidence of whether climate change is influencing the year cicadas emerge is relatively murky, it seems clearer that weather is bringing them above ground earlier in the spring than in the past.

In the first half of the 20th century, it was rare to hear cicadas chirping before late May, but this year, reports started coming in late April, he said.

Reports to magicicada.org show cicadas, or their skins, are being spotted in the largest numbers in the greater Washington area, including across Montgomery County. Clusters also have been spotted around Bowie, Crofton and Columbia, with more isolated sightings in Baltimore, Towson, Reisterstown and Bel Air.

Simon said she is hoping reports keep coming in. Entomologists aren't just looking for signs such as mating calls or empty shells, but also broken tree branches and twigs that may have been weighed down by cicada eggs.

They also need to know when cicadas were last spotted in the same yard, park or forest - whether during the major swarm of 2004, or the less notable event in 2000.

The information could help them distinguish whether the cicadas appearing now are early members of Brood X, or members of the more southern Brood VI that simply flew in under the radar, before crowdsourcing even existed.

Raupp said either explanation would not be surprising. Cicadas' life cycles have long been known to accelerate, and small numbers of Brood VI have been spotted in Maryland before.

But others who dedicate their research to cicadas said it's an exciting - and rare - opportunity to learn more about the mysterious insects' biology.

"You've got to be patient to do this," Kritsky said. "This is what we live

for."

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