FORBES > INNOVATION > SCIENCE

Emperor Penguins Are On The Move to Avoid Breeding On Melting Ice

GrrlScientist Senior Contributor
I write about evolution, ecology and behavior in animals

Follow

0

Jan 24, 2024, 11:38am EST

Updated Jan 24, 2024, 11:51am EST

As the rapidly worsening climate catastrophe triggers ever more Antarctic ice to melt, emperor penguins, which breed on ice, are facing an uncertain future

Adult emperor penguins (Aptenodytes forsteri) with a chick near Halley Research Station in ... [+] BRITISH ANTARCTIC SURVEY

In a rare bit of good news, it has been revealed that at least some emperor penguins are relocating their breeding colonies and establishing new ones because the rapidly worsening climate catastrophe is melting yet more patches of frozen sea ice where they used to breed. Satellite imagery revealed four previously unknown emperor penguin breeding colonies, bringing the total number identified in Antarctica to 66.

“It’s good that even as emperors are being affected by changing ice conditions, we’re still finding colonies,” said study author, Geographic Information Officer Peter Fretwell, an award-winning cartographer and leading scientist with the British Antarctic Survey (BAS). Dr Fretwell’s pioneering work currently focuses on the use of the EU’s twin Sentinel-2 spacecraft, to provide very high resolution satellite imagery that he uses to count and study polar wildlife, a project that has led to him discovering almost half of the world’s known emperor penguin colonies.

Due to Antarctica’s size and remoteness, satellites are the only practical method for finding emperor penguin breeding colonies. The colonies are discovered from space based on the birds’ guano (arrows, Figure 2), readily visible as reddish-brown stains on the white ice when large enough numbers of the birds gather together, as they do when they are breeding.

F I G U R E 2 : Sentinel-2 images of the four new sites taken at consistent scale. Arrows show ... [+] DOI:10.1017/S0954102023000329

The discoveries don't increase the known emperor penguin population size by much — only a few thousand individuals each — but the satellite images do provide useful information regarding the movements of penguin breeding colonies. For example, repeated satellite imagery has allowed Dr Fretwell to document repeated attempts by emperor penguins to re-establish the Halley Bay breeding colony, once the second largest in Antarctica, until it suddenly and tragically broke up in 2016, killing all the young penguins there. Another catastrophic breeding failure happened last year, where all but one out of five sites monitored in the Bellingshausen Sea region experienced a 100% loss of chicks (ref).

When the sea ice breaks up, the penguin chicks meet a gruesome end.

"Chicks that go into the water will likely drown, but even if they manage to get back out they will probably freeze to death," Dr Fretwell explained.

Penguin breeding colonies tend to be separated from each other by an average of about 250km (150 miles). Dr Fretwell and collaborators have been using satellites to search the gaps within this spacing for groups of birds they didn't previously know about. At this time, they think all significant emperor penguin colonies have been found.

The four newly discovered colonies likely existed for many years, but scientists hadn't previously spotted them, Dr Fretwell pointed out. These colonies are mostly small, numbering less than 1,000 breeding pairs each.

Life cycle of emperor penguins (Aptenodytes forsteri). (Credit: Zina Deretsky, National Science ... [+] ZINA DERETSKY, NATIONAL SCIENCE FOUNDATION VIA A CREATIVE COMMONS LICENSE

The emperor penguin, *Aptenodytes forsteri*, is the tallest and heaviest of all living penguin species. They are found only in Antarctica, where they live in extreme conditions. Emperor penguins huddle together together during the middle of the Antarctic winter to court, mate, lay and hatch eggs, and rear their

chicks in groups. If the ice breaks up before the chicks fledge, as occurred last year, tens of thousands of them will freeze or drown.

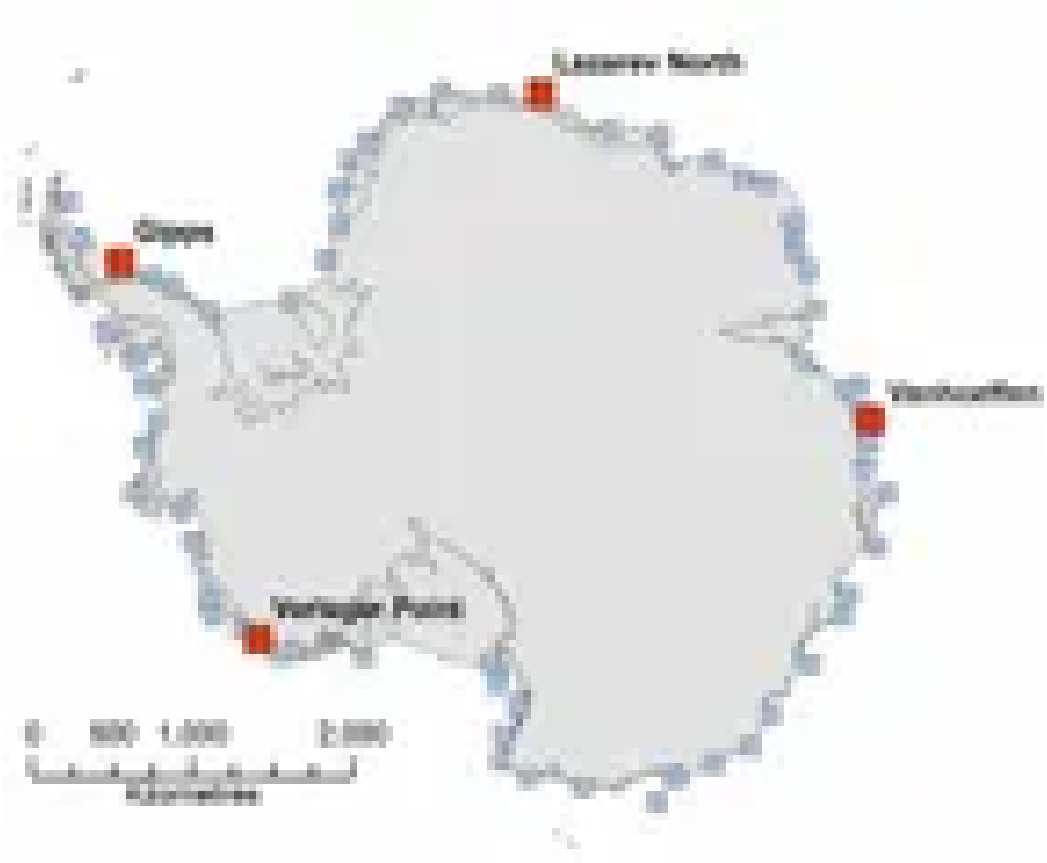
Emperor penguins breed on sea-ice connected to the coast — known as fast ice. This type of ice is diminishing in parts of Antarctica and is becoming more variable, which makes it questionable whether these penguins can survive long in a rapidly warming world.

Thanks to global warming, emperor penguins are currently classified as “near threatened” with an overall population of less than 300,000 breeding pairs. As with polar bears at the other extreme end of the planet, global warming caused mainly by burning fossil fuels is the only factor threatening the long-term viability of these birds.

And still, they persist.

“Emperor penguins have taken it upon themselves to try to find more stable sea ice,” Dr Fretwell reported.

For example, one penguin colony near Halley Bay appears to have moved around 30 kilometers (19 miles) to the east, Dr Fretwell explained. The new Gipps colony also shows evidence in the satellite record of having shifted its location over time (Figure 1).



F I G U R E 1 : Newly reported emperor penguin colonies, shown in red boxes. Light blue boxes denote ... [+] DOI:10.1017/S0954102023000329

Two other breeding colonies, one named Verleger Point and the other known as Vanhoeffen, appear to have a more permanent history. Dr Fretwell noted that Vanhoeffen was probably missed in previous searches because it's located on fast ice that developed around old icebergs stuck in shallow water roughly 30km offshore.

"When we do get future ice losses, emperors can and will move," Dr Fretwell remarked. "It's in their nature."

"It just shows this is a species that has to be dynamic."

Unfortunately, the accelerating impact of climate change in Antarctica threatens to outpace the penguins' resilience and capacity to adapt.

Source:

Peter Fretwell (2024). **Four unreported emperor penguin colonies discovered by satellite**, *Antarctic Science* | doi:10.1017/S0954102023000329

Socials: *Bluesky* | *CounterSocial* | *Gab* | *LinkedIn* | *Mastodon Science* | *Post.News* | *Spoutible* | *SubStack* | *Threads* | *Tribel* | *Tumblr* | *Twitter*

Follow me on Twitter or LinkedIn. Check out my website.

GrrlScientist

Follow

... **Read More**

Editorial Standards Reprints & Permissions

One Community. Many Voices. Create a free account to share your thoughts. Read our community guidelines here.