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Breeding Cycles of Penguins in the Western Antarctic Peninsula Affected By Global Warming, For Better or Worse

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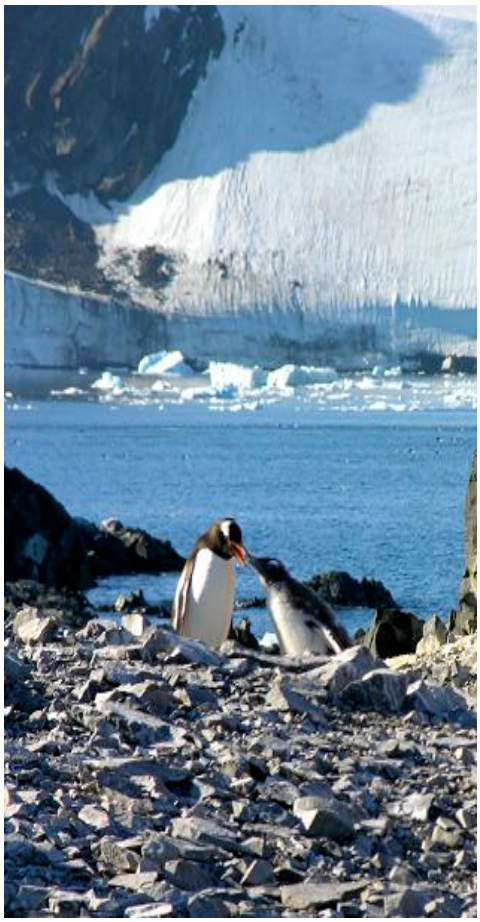
Because they are unaware of local conditions in the Western Antarctic
Peninsula, chinstrap penguins are unable to quickly adapt their breeding schedules to rising temperatures. (Photo: Lieutenant Philip Hall, NOAA Corps [1])

Higher global temperatures from climate change, despite their appeal to the human population, have chilling affects for some penguin species that breed in the Western Antarctic Peninsula. While gentoos are able to adapt to the region's rapidly warming climate, adélie and chinstrap penguin populations are dwindling, according to research published in *Polar Biology* [2], *Ecology* [3], and *Marine Ecology Progress Series* [4] (MEPS).

Using a combination of traditional ecological fieldwork and state-of-the-art satellite imagery to track colonies of the three species in Antarctica, researchers confirmed what scientists already knew about many creatures in more temperate climates: Rising temperatures may affect animals' breeding patterns and population. Resident gentoo penguins, they found, are able to account for temperature change faster than migratory breeding penguins in the Western Antarctic Peninsula.

"We don't think that a gain in the gentoo population is necessarily a loss for the adélie and chinstrap, but in previously-dominated adélie and chinstrap islands, the gentoo is now dominating," says Stony Book University Ecology and Evolution assistant professor Heather Lynch, the studies' lead author.

Gentoo, adélie, and chinstrap penguins all breed in one of the world's most rapidly warming regions. But while adélie and chinstrap penguins migrate to the Western Antarctic Peninsula to breed, the gentoo population is a permanent resident. So when their home temperature increases from climate change, gentoos are able to adapt quickly, advancing their "clutch initiation" by almost twice as much as the adélie and chinstrap. Unaware of the warming conditions, these two species arrive at their breeding grounds on a normal schedule, unable to advance their breeding cycles as quickly as the gentoo. Gentoos also prefer areas with less sea ice, while the adélie and chinstrap rely on Antarctic krill, a species that requires sea ice for its life cycle.



Gentoo penguin mother feeding her chick in Antarctica, Antarctic Peninsula. Gentoo penguins are able to adapt their breeding cycle quickly in the Western Antarctic Peninsula.(Photo: PaoMic /CC-by-3.0 [5])

"Residents species will do better than migrant species with climate change," Lynch says. "Migrant species don't have that local-scale information. This has been seen in a number of different systems.

Though gentoos are quicker to respond to temperature change, adélie and chinstrap penguins also adjust somewhat, taking less time to court after arriving in the peninsula. But even though they might begin breeding sooner, the penguins don't return to their non-breeding grounds quicker so that their schedule would be completely adjusted, says Lynch.

"I don't think we have a really good sense of what they're cues are for returning," she says, noting some studies indicate the species return from breeding based on the length of day. "And those cues are not changing," Lynch adds.

Lynch explains her and her colleagues' findings highlight the importance of looking at conservation of migrant populations differently.

"We have to think regionally," Lynch adds. "We have to think big picture, its not enough to study individual populations, these are complex problems and we need to think big," she says. Lynch explains that the satellite technology used in these studies could make that easier.

"We have an opportunity with colonial nesting birds to start using satellites now," she says.

“We think that population tracking has to involve a tremendous amount of field work, but now some of it can be done on a computer.”

Two courting adélie penguins. (Photo: Cool Antarctica [6])

Lynch will speak about this research and the advances in the use of satellite imagery to track penguin populations as part of "Polar Climate Change Research: A Workshop for Educators" at the Charles B. Wang Center at Stony Brook University on April 10-11.

Animals Birds Climate Change Nature Wildlife

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