

Limiting warming to 1.5 degree C would save majority of global species from climate change

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Limiting global warming to 1.5°C would save the vast majority of the world's plant and animal species from climate change—according to new research led by the University of East Anglia.

A new report published today in *Science* reveals that limiting [warming](#) to the ultimate goal of the Paris Agreement would avoid half the risks

associated with warming of 2°C for plants and animals, and two thirds of the risks for [insects](#).

Species across the globe would benefit—but particularly those in Southern Africa, the Amazon, Europe and Australia.

Reducing the risk to insects is particularly important, the team say, because they are so vital for 'ecosystem services' such as pollinating crops and flowers, and being part of the food chain for other birds and animals.

Previous research focused on quantifying the benefits of limiting warming to 2°C above pre-industrial times—the upper limit for temperature as set out in the Paris Agreement—and did not look at insects.

This is the first study to explore how limiting warming to 1.5°C would benefit species globally.

Researchers at UEA and James Cook University in Australia studied some 115,000 species including 31,000 insects, 8,000 birds, 1,700 mammals, 1,800 reptiles, 1,000 amphibians and 71,000 plants in this, the largest scale study of its kind.

Lead researcher Prof Rachel Warren, from the Tyndall Centre for Climate Change Research at UEA, said: "We wanted to see how different projected climate futures caused areas to become climatically unsuitable for the species living there.

"We measured the risks to biodiversity by counting the number of species projected to lose more than half their geographic range due to climate change.

"We found that achieving the ultimate goal of the Paris Agreement, to limit warming to 1.5°C above pre-industrial levels, would reap enormous benefits for biodiversity—much more so than limiting warming to 2°C.

"Insects are particularly sensitive to climate change. At 2°C warming, 18 per cent of the 31,000 insects we studied are projected to lose more than half their range.

"This is reduced to 6 per cent at 1.5°C. But even at 1.5°C, some species lose larger proportions of their range.

"The current [global warming](#) trajectory, if countries meet their international pledges to reduce CO₂, is around 3°C. In this case, almost 50 per cent of insects would lose half their range.

"This is really important because insects are vital to ecosystems and for humans. They pollinate crops and flowers, they provide food for higher-level organisms, they break down detritus, they maintain a balance in ecosystems by eating the leaves of plants, and they help recycle nutrients in the soil.

"We found that the three major groups of insects responsible for pollination are particularly sensitive to warming.

"If temperatures rise by 3°C, ecosystem services provided by insects would be greatly reduced. Other research has already shown that insects are already in decline for other reasons, and this research shows that climate change would really compound the problem."

The study includes the ability of species to relocate to more suitable locations as the world warms. Birds, mammals and butterflies have the greatest ability to disperse. The dispersal means that a small number of species can gain in range by 2100.

Prof Warren added: "If warming is limited to 1.5°C by 2100 then more species can keep up or even gain in range, whereas if warming reached 2°C by 2100 many species cannot keep up and far more species lose large parts of their range."

Co-author Dr. Jeff Price, also from UEA, added: "Examples of animals to really benefit from limiting warming to 1.5 include the critically endangered Black Rhinoceros, which is already highly threatened by poaching and habitat loss.

"There are also [species](#) which have been important in evolutionary theory and studied since the time of Charles Darwin, which would benefit from limiting warming to 1.5°C. These include Darwin's Finches of the Galapagos, such as the Large Ground Finch."

More information: R. Warren et al., "The projected effect on insects, vertebrates, and plants of limiting global warming to 1.5°C rather than 2°C," *Science* (2018). [science.sciencemag.org/cgi/doi ... 1126/science.aar3646](https://science.sciencemag.org/cgi/doi/10.1126/science.aar3646)

Provided by University of East Anglia

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