

New study reveals contrasting consequences of warmer Earth

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A new study, by scientists from the Universities of York, Glasgow and Leeds, involving analysis of fossil and geological records going back 540 million years, suggests that biodiversity on Earth generally increases as the planet warms.

But the research says that the increase in biodiversity depends on the evolution of new species over millions of years, and is normally accompanied by extinctions of existing species. The researchers suggest that present trends of increasing temperature are unlikely to boost global biodiversity in the short term because of the long timescales necessary for new forms to evolve. Instead, the speed of current change is expected to cause diversity loss. The study which is published in [Proceedings of the National Academy of Sciences](#) (*PNAS*) says that while [warm periods](#) in the geological past experienced increased extinctions, they also promoted the origination of new species, increasing overall biodiversity.

The new research is a refinement of an earlier study that analysed biodiversity over the same [time interval](#), but with a less sophisticated data set, and concluded that a warming climate led to drops in overall diversity. Using the improved data that are now available, the researchers re-examined patterns of marine invertebrate biodiversity over the last 540 million years.

Lead author, Dr Peter Mayhew, of the Department of Biology at York, said: "The improved data give us a more secure picture of the impact of warmer temperatures on [marine biodiversity](#) and they show that, as

before, there is more extinction and origination in warm geological periods. But, overall, warm climates seem to boost biodiversity in the very long run, rather than reducing it."

Dr Alistair McGowan, of the School of Geographical and Earth Sciences at the University of Glasgow said: "The previous findings always seemed paradoxical. Ecological studies show that [species richness](#) consistently increases towards the Equator, where it is warm, yet the relationship between biodiversity and temperature through time appeared to be the opposite. Our new results reverse these conclusions and bring them into line with the ecological pattern."

Professor Tim Benton, of the Faculty of Biological Sciences at the University of Leeds, added: "Science progresses by constantly re-examining conclusions in the light of better data. Our results seem to show that temperature improves [biodiversity](#) through time as well as across space. However, they do not suggest that current global warming is good for existing species. Increases in global diversity take millions of years, and in the meantime we expect extinctions to occur."

More information: Biodiversity tracks temperature over time, *PNAS*, 2012.

Provided by University of York

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