Permo-Triassic biodiversity patterns could offer a window into our climate future
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A new study by the University of Leeds and University of Oxford has examined spatial biodiversity patterns across the Permo-Triassic mass extinction event (c. 252 million years ago). The Permo-Triassic mass extinction represents the most catastrophic event in the last 500 million years of evolutionary history and caused the loss of up to 95% of species because of a cocktail of volcanic effects including extreme greenhouse warming.

Examination of the global distribution of tetrapods—amphibians, reptiles and their relatives—reveals that biodiversity was consistently higher at temperate latitudes, both before and after the mass extinction. This is in strong contrast to the modern day, where the greatest levels of biodiversity are found in the low latitudes of the tropics, near the equator.

The study, published in the journal *Proceedings of the Royal Society B*, shows how patterns of biodiversity can respond when temperatures in tropical regions become too extreme to support high levels of biodiversity. Examining the responses of organisms to rapid climatic changes in the distant past can offer a window into the potential impact of future global warming.

Study lead author Bethany Allen, Ph.D. researcher at the School of Earth and Environment at Leeds, said: "Higher equatorial diversity has been recognized for over 200 years, but the consistency of this pattern throughout Earth history has been uncertain.

"The Late Permian to Middle Triassic is an ideal time interval to examine biodiversity trends. It is characterized by large-scale volcanic episodes, extreme greenhouse temperatures, and the most severe mass extinction event in Earth's history.

"Our study shows that the regions we now associate with some of the richest and most diverse ecosystems on Earth were once too hot to support communities of large animals, likely reaching over 40°C. In the face of a rapidly warming planet, this window into our past could offer a glimpse into the future of those regions and the very real risk to the species that live there if we do not act to curb our carbon emissions and limit global warming."


Provided by University of Leeds