# [***Using AI to see how well past extinctions can predict future biodiversity loss***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:68PD-B661-DYDW-7263-00000-00&context=1516831)

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**Body**

July 14 -- Evidence from past extinctions cannot be used as a definitive way of predicting future ***biodiversity*** ***loss***, scientists have found by using AI.

A team of researchers including Dr. James Witts of the University of Bristol's School of Earth Sciences and led by Dr. William Foster from Hamburg University used fossils from previous mass extinctions to see if AI-generated models can accurately predict extinction vulnerability.

Despite expectations, this research found that mass extinctions could not be used to generate predictive models for other ***biodiversity*** crises, with no common cause flagged. This is because marine communities are constantly evolving and no two mass extinctions are impacting the same marine ecosystem.

Co-author Dr. Witts explained, "In a time of increasing extinction risk, knowing whether we can make predictions about the vulnerabilities of different organisms to extinction is essential."

Dr. Foster continued, "The scale of environmental change currently affecting our planet is unprecedented in human history, and so the best source of evidence we have for comparable environmental change lies in the deep past, accessible via analysis of the fossil record.

"The sheer volume of information means that evaluating the vulnerability of different species to extinction is complex, but AI models provide a potential solution to such intensive data science problems, and can be used to identify extinction vulnerability."

The interdisciplinary team of data scientists and evolutionary biologists created a machine learning model to investigate the extinction vulnerability of marine life during the three most catastrophic mass extinctions, the end-Cretaceous (the one that wiped out the dinosaurs 66 million years ago), end-Triassic (200 million years ago) and end-Permian (252 million years ago) mass extinctions.

Their findings, published today, March 15, in Royal Society Open Science, show that even though they were able to uncover extinction vulnerability patterns during the mass extinctions, each individual event appears to have had a unique vulnerability signature, which cannot be used to predict extinction selectivity in other past or future events.

"Previously we thought that mass extinction events from different periods of Earth history but which were caused by similar mechanisms like massive volcanism, affected life in similar ways, but our study suggests that each extinction event leaves a very unique signal in the fossil record," added Dr. Witts.

There are several factors contributing to this lack of predictability across different extinction events. Ocean life has constantly been evolving over hundreds of millions of years. That means, that marine ecosystems contain different species, and are structured fundamentally differently, prior to each extinction event. In addition, the ways in which an injection of carbon into the atmosphere affects marine ecosystems have evolved too. There are also differences in the species which enter the fossil record over time, particularly compared to those known in the modern-day, which makes drawing comparisons more difficult.

This suggests that large-scale models of extinction vulnerability based on past mass extinctions will not inform us about how to conserve modern-day ***biodiversity*** in a crisis. However, the team hopes to look at developing more sophisticated models, which look at individual groups of animals, or the process and dynamics of ecosystem collapse.

"These new results give us the opportunity to look at how we can generate new data that can potentially help us generate predictive models," said Dr. William Foster. "We also now have a technique to try and explore extinction vulnerability during our current ***biodiversity*** crisis."

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