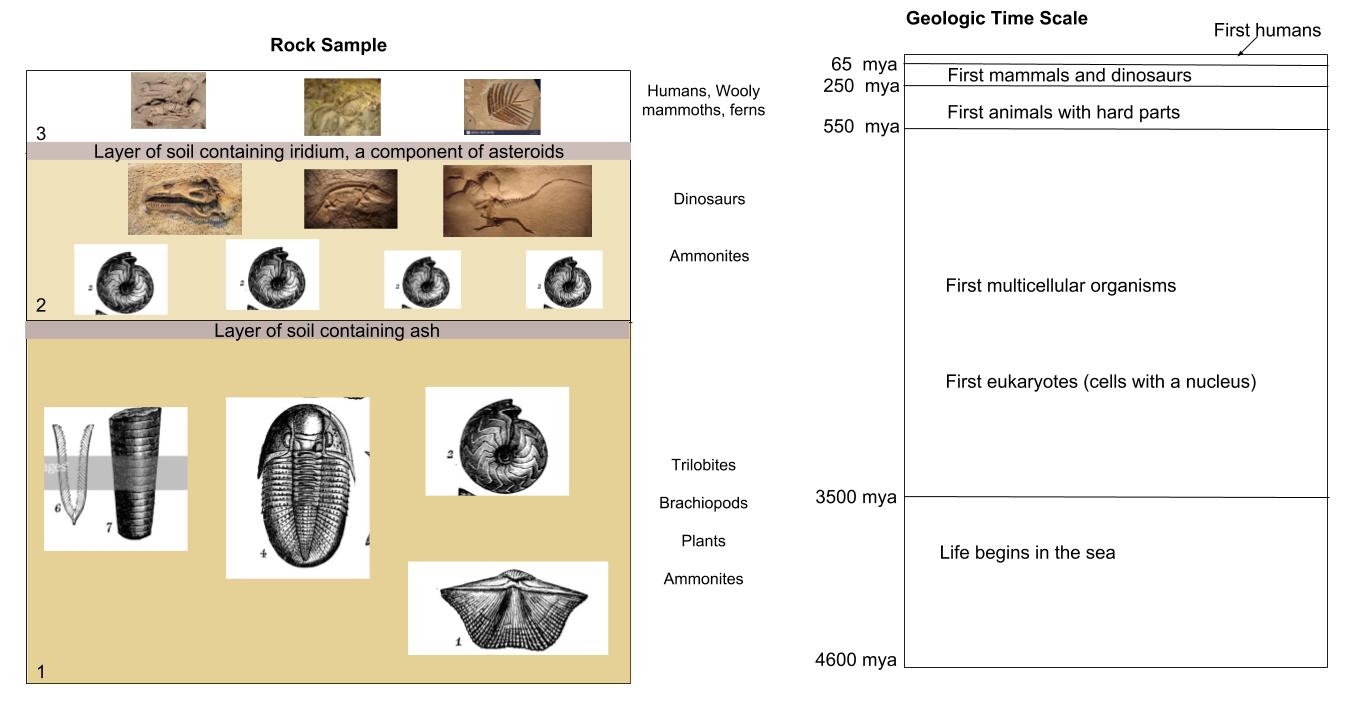
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**Mass Extinctions Tied to Past Climate Changes**

*(Adapted from a Scientific American article by Davied Biello, 10/24/07)*

Fossil and temperature records over the past 520 million years show a correlation between extinctions and climate change.

Roughly 251 million years ago, an estimated 70 percent of land plants and animals died, along with 84 percent of ocean organisms—an event known as the [end Permian extinction](https://www.scientificamerican.com/article.cfm?articleID=00037A5D-A938-150E-A93883414B7F0000). The [cause is unknown](https://www.scientificamerican.com/article.cfm?articleID=0002C42F-DB79-10A3-9B7983414B7F0000) but it is known that this period was also an extremely warm one. A new analysis of the temperature and fossil records over the past 520 million years reveals a common connection: global warming is consistently associated with [planetwide die-offs](https://www.scientificamerican.com/article.cfm?articleID=000080CA-1C3D-143C-9C3D83414B7F0000).

Ecologist Peter Mayhew of the University of York in England led the research examining the fossil and temperature records. He says, "The fossil record and temperature data sets already existed but nobody had looked at the relationships between them."

He looked at the relative number of different shallow sea organisms still in existence during a given time period and the record of temperature of that time period. This revealed that eras with relatively high concentrations of greenhouse gases bode ill for the number of species on Earth. "The rule appears to be that greenhouse worlds negatively affect biodiversity," Mayhew says.

This paints a scary picture for the fate of species currently on Earth. As the [global temperatures continue to rise](http://sciam.com/article.cfm?articleID=A1E03678-E7F2-99DF-349533FA77189693) to levels similar to those seen during the Permian, many species are at risk. "The risk of future extinction through rapid global warming is expected," notes Mayhew and his colleagues write in Proceedings of the Royal Society B: Biological Sciences.

That is not to say that global warming was the cause of this Permian wipeout or that all mass extinctions are associated with warmer worlds. For example, 60 percent of marine organisms disappeared during the cooling at the end of the [Ordovician](https://www.scientificamerican.com/article.cfm?articleID=000CC5E6-9AB7-153F-9AB783414B7F0000) period roughly 430 million years ago. But these scientists argue that the evidence of a link between any type of climate change and mass extinctions gives reason to be [concerned for the future](https://www.scientificamerican.com/article.cfm?articleID=000080CA-1C3D-143C-9C3D83414B7F0000). "We need to know the mechanism behind the associations," Mayhew says. "That will help us decide if this is really a worry for the next generation or if the threat is merely a distant future threat."