

## Mass Extinctions

There have been 5 mass extinctions visible in the fossil record of our Earth, and these hold valuable lessons for us today. Each has followed a similar pattern: a major perturbation, a near-disastrous loss of biodiversity, followed by 10 million to 100 million years to recover, during which time there emerges an explosion of new, more complex, adaptive, and elegant life forms.

Many scientists believe that we are now in a 6th mass extinction, this one brought about by the activity of a single species - the human. This time, though, we may not have tens of millions of years to recover - not if humans are to remain part of the process.

### Summary of first 5 major extinctions

1. The first great extinction on record occurred approximately 440 million years ago, in what is called the late Ordovician period. More than half of all marine and land species are extinguished, apparently as a result of climate change.

It takes Earth 25 million years to recover its biodiversity, much of it with new creatures.

2. The second great extinction occurred about 365 million years ago, towards the end of the Devonian period. As many as 70 percent of all species vanish, the cause again apparently related to climate change. It takes Earth 30 million years to recover.

3. The third and largest extinction occurred at the end of the Permian, about 245 million years ago. It has been estimated that as many as 96 percent of all marine species are lost, while on land more than three quarters of all vertebrate families become extinct.

Many causes have been proposed for the Permian extinctions - but the most important factor seems, once again, to be climate change.

4. The fourth great extinction occurred about 208 million years ago - in the late Triassic period - only 37 million years after the Permian extinction. Climate change - in particular an increase in rainfall - again seems to have been an important cause. About half of all species are lost, opening up opportunities for a relatively new species to emerge: the dinosaurs.

Taking the third and fourth great extinctions together, Earth takes more than 100 million years to recover.

5. The fifth and best known great extinction occurred about 65 million years ago, at the boundary of the Cretaceous and the Tertiary periods. The event takes half the species worldwide, including the dinosaurs, while creating a new opening for our own ancestors, the mammals. The cause of the extinction is suspected to have been a giant meteorite crashing into Earth, severely disrupting Earth's ecosystem. It takes 30 million years for Earth's biodiversity to recover.

Many scientists believe that today we are in a 6th great extinction, largely due to the destruction of habitat caused by human activity. Currently, Earth is losing species at a rate of 20,000 per year - a rate that exceeds the onset of previous evolutionary extinctions.