

The Late Devonian Extinction

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Despite the moniker of 'Late Devonian Extinction', it is not one specific event, but rather a series of events spread over the mid to late Devonian Period (McGhee, 1988). Causes of the extinction range from sea-level change and marine anoxia (Bond and Wingall, 2008), climate change (Brezinski et al., 2009)(De Vleeschouwer et al., 2017), to collapse of speciation and abundance of invasive species (Stigall, 2012).

Biodiversity during the Phanerozoic

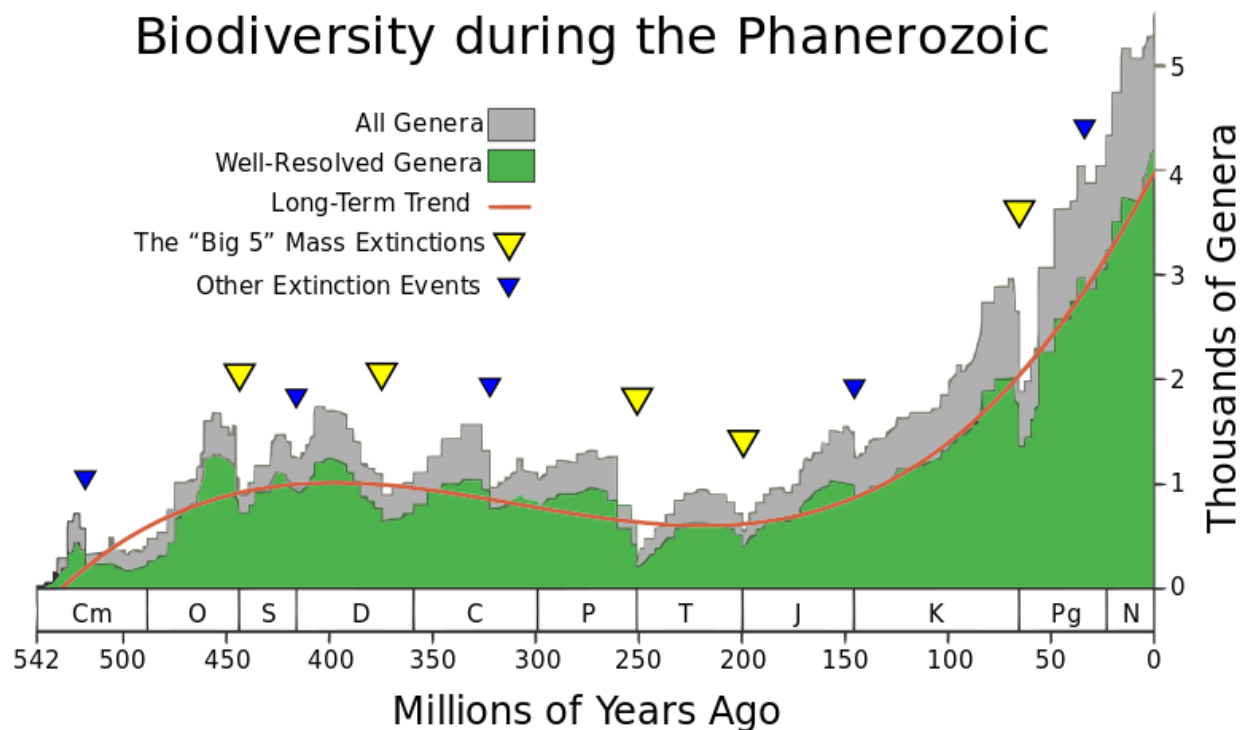


Figure 1. Biodiversity during the Phanerozoic. (Mestre, 2008). Adapted from Rohde and Muller (2005).

As shown in Figure 1, the extinction events of the late Devonian do not occur as a single rapid event, but appear to occur in a stepwise

fashion over a longer period than previous or subsequent events. The significance of the late Devonian extinctions in reference to biodiversity is shown that overall biodiversity trended negatively until the Jurassic Period and did not surpass Devonian levels until the Cretaceous Period. Understanding the processes and events that caused the resulting extinctions and long term in the past can be advantageous to understanding more recent and potential future events.

References:

- Bond, D.P.G., Wignall, P.B., 2008. The role of sea-level change and marine anoxia in the Frasnian-Famennian (Late Devonian) mass extinction, *European Urology*, vol. 263 no. 3-4 , p.107 - 118.
- Brezinski, D., Cecil, C. B., Skema, V. w., Kertis, C. A., 2009. Evidence for long-term climate change in Upper Devonian strata of the central Appalachians, *Palaeogeography, Palaeoclimatology, Palaeoecology*. 284:(3-4), 315-325.
- De Vleeschouwer, D., Da Silva, A. C., Sinnesael, M., Chen, D., Day, J.E., Whalen, M. T., Gou, Z., Claeys, P. 2017. Timing and pacing of the Late Devonian mass extinction event regulated by eccentricity and obliquity, *Nature Communication*. vol. 8, article 2268, p. 1-11
- McGhee Jr., G. R., 1988. The Late Devonian extinction event: evidence for abrupt ecosystem collapse, *Paleobiology*. vol. 14, no. 3, p 250-57
- Mestre, A, 2008. Phanerozoic Biodiversity.svg.
<https://commons.wikimedia.org/wiki/File:Phanerozoic_Biodiversity.svg>, accessed Nov 5, 2020.
- Stigall, A.L. 2012. Speciation collapse and invasive species dynamics during the Late Devonian "Mass Extinction". *GSA Today*. vol 22, no. 1, p. 4-9.
- Rohde, R. A., Muller, R. A., 2005. Cycles in fossil diversity, *NATURE*, vol. 434. P. 208-210.