

Ordovician-Silurian Mass Extinction

Correlated with falling sea level
Correlated with Cape St. Mary's lava flows

Extinction Estimates for Marine Species:
80–85% of species | 40–57% of genera
25–27% of families

The brachiopod *Plaesiomys*, which disappeared in the Ordovician-Silurian boundary extinction pulse, along with about 1/3 of the families of brachiopods and bryozoans, and 3 orders of trilobites.



Image: Hectonichus, CC by SA 4.0

Upper Devonian Mass Extinction Pulses

Correlated with falling sea level

Correlated with Viluy lava flows in Siberia

Correlated with Siljan impact crater in Sweden

Extinction Estimates for Marine Species:

70–80% of species | 35–50% of genera

15–20% of families

The giant armored fish, *Dunkleosteus*, which disappeared along with most trilobites, brachiopods, colonial corals, and jawless fish in the Upper Devonian extinction pulses.



Image: Aunt Spray; Shutterstock

Permian-Triassic Mass Extinction

Correlated with falling sea level
Correlated with large Siberian Traps

Extinction Estimates for Marine Species:

81–94% of species | 62–83% of genera

50–57% of families

Neospirifer, a brachiopod (lamp shell) disappears from the fossil record at the top of the Permian layers, along with most other marine invertebrates, and about 70% of terrestrial vertebrate families.



Pedunculate valve (*left*) and lateral view (*right*) of *Neospirifer*

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Upper Triassic Mass Extinction Pulses

Correlated with falling sea level
Correlated with Central Atlantic Magmatic Province (CAMP)

Extinction Estimates for Marine Species:
71–80% of species | 34–49% of genera
20–23% of families

Fossilized remains of *Serpianosaurus*, a marine reptile that disappears from the fossil record at the Triassic-Jurassic boundary, along with many ammonoids, brachiopods, gastropods, bivalves, and both marine and terrestrial reptiles.



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Cretaceous-Paleogene Boundary Extinction

Correlated with falling sea level

Correlated with Deccan Traps in India

Correlated with Chicxulub Crater in Mexico
and Boltysh Crater in Ukraine

Extinction Estimates for Marine Species:

67–80% of species | 40–50% of genera

17% of families

Fossilized remains of *Parapuzosia*, the largest ammonite known. Ammonites disappear from the fossil record at the top of the Cretaceous layers, along with dinosaurs, plesiosaurs, mosasaurs, pterosaurs, and two major groups of bivalves.



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