

ECOSYSTEM RECOVERY AFTER THE END-PERMIAN MASS EXTINCTION

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The end-Permian mass extinction was the largest such event in the entire Phanerozoic. Recovery of the marine fauna was apparently very slow, with “complex” ecosystems such as reefs not appearing until the Middle Triassic. New data from northern Italy (Dolomites and Carnic Alps) and Slovenia show that recovery began much earlier in western Tethys.

The Griesbachian is dominated by bedding-plane assemblages of e.g. *Lingula* and *Claraia*. These show the characteristic low diversity and high abundances of opportunistic blooms in an otherwise stressed environment. The presence of “disaster” taxa such as stromatolites and *Earlandia* is also noticeable. Trace fossils are very small and rare, and coupled with sedimentological data (laminations, pyrite lags) suggest widespread anoxia. This conclusion is supported by independent gamma-ray spectrometry of the units.

Normal oxygenation returns in the late Griesbachian. The disaster taxa are no longer seen, and although *Lingula* and *Claraia* are still present, other benthos (especially gastropods and echinoderms) have returned. Recovery can be documented in trace fossil assemblages and a modest level of tiering re-appears.

Diversity decreases in the Smithian, due to a return to stressed conditions. The fauna is dominated by small bodied ophiuroids and small, infaunal bivalves. The sediments show that there was high input into the basin, producing turbid and possibly brackish conditions.

By Spathian times the environmental conditions had returned to normal. There was a large burst of radiation throughout the fauna. There is evidence of tiering above and below the sediment with trace fossil assemblages dominated by *Rhizocorallium*. Ammonoids make a return to western Tethys. This recovery continues up into the Middle Triassic.