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# Sea level and marine anoxia during the Frasnian-Famennian (Late Devonian) mass extinction

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The Frasnian-Famennian (Late Devonian) extinction constitutes one of the “big 5” crises of the Phanerozoic fossil record. The extinctions are closely associated with two discrete anoxic events, manifest in Germany as the bituminous Kellwasser Horizons, and consequently, marine anoxia has become one of the leading candidates for the causal mechanism. Eustatic sea-level fluctuations have also been proposed as the cause of the extinctions, both regressive, and transgressive. Marine anoxia and sea-level are intimately linked, and the relationship between the two is here examined in detail, with the widely accepted Devonian eustatic curve of Johnson *et al*. (1985) being a reference point. Evidence for marine anoxia is provided by the analysis of pyrite framboids and microfacies in geographically widespread locations. This suggests that anoxia developed in many regions simultaneously during the latest Frasnian. There is little lithological evidence for regression at this time – rather it is likely that the Kellwasser Horizons and associated anoxic facies developed during a period of eustatic highstand which lasted into the Famennian. Thus, marine anoxia, rather than regression, is the more likely killer in the Frasnian oceans.