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Mass extinctions, recovery and resilience

Marine anoxia and mass extinction – a ubiquitous link?

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Ever since Hallam made the link between marine anoxia and extinction in the Early Jurassic nearly 60 years ago, the role of anoxia in the mass elimination of marine taxa has figured prominently in the literature. The spread of anoxic deposition acts to limit habitat area and even slightly dysoxic conditions are inimical to most marine forms. Marine anoxia is a principal contender for the Permo-Triassic mass extinction with the evidence including the widespread development of pyrite-rich facies and the extraordinary occurrence of black shales in all known occurrences of accreted deep-ocean sediments. The impact on ocean trace metal budgets was marked and seen in a decline in their enrichment factors. Widespread marine anoxia is also seen during other extinction events (e.g. Frasnian-Famennian, end-Devonian, Capitanian) but for others anoxia is either developed after the mass extinction crisis (end-Triassic) or there is no associated mass extinction at all (Bonarelli Event). The reasons for this hit-and-miss relationship will be considered.