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Mass extinctions, recovery and resilience

The terrestrial expression of the Late and End Devonian Mass Extinctions

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There were two mass extinction events in the Devonian (the Frasnian/Famennian and the End Devonian Mass Extinction at the Devonian-Carboniferous boundary. The Devonian has a well-developed terrestrial facies within extensional basins on the Old Red Sandstone Continent. This contains a direct record of climatic change within the Late Devonian that can be integrated with the palynological record. The Frasnian/Famennian section shows two interval of warming with a very active fluvial system, both succeeded by very arid episodes of stacked palaeosols. Palynological correlation shows these represent the Lower and Upper Kellwasser Events. Comparisons with other LIP driven extinction events show these as the comparable response to a LIP eruption with high CO_2 and a warm climate to produce a very active sedimentary systems that then causes excess drawdown and a cool arid climate.
The Devonian-Carboniferous boundary is a strong contrast with an intense arid interval that palynological correlation show equivalent to the terminal Devonian glaciation. This is followed by significant warming atypical for the basin and which produced intense seasonal rainfall that produced a deep stratified lake. Palynological extinctions are highly concentrated over a short interval within the lake.