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Late Permian to Early Triassic palaeo-pCO2 and high latitude palaeotemperature (PT-clim)

Recent studies documented an 8° C temperature rise in low latitudes in the latest Permian. Temperatures continued to increase in the Early Triassic and potentially became inimical to life in low latitudes. High atmospheric CO2 levels in conjunction with high temperatures and anoxic conditions in large parts of the World's Early Triassic oceans may have been responsible for the protracted recovery in the aftermath of end-Permian mass extinction. However, to date, neither the atmospheric CO2 evolution nor temperature records from higher latitudes are available that could further constrain a causal link between high atmospheric CO2 levels, high to very high temperatures, the Late Permian mass extinction and the slow recovery in the Early Triassic.
This study focuses on the reconstruction of atmospheric pCO2 levels and higher latitude temperatures for the latest Permian to early Middle Triassic in order to get a more comprehensive understanding of the latitudinal temperature evolution during this critical time interval. Carbon isotopes measured on carbonate palaeosols will be used to estimate palaeo-pCO2, higher latitude palaeotemperatures will be reconstructed from oxygen isotopes measured on conodont apatite. The temperature as well as pCO2 records will then be compared to palaeobiological patterns from lower and higher latitudes in order to assess the ecological selectivity of faunal responses to these two components of the deadly trio (temperature, CO2, and anoxia)