Investigating the sulphur cycle during the end-Triassic mass extinction from Panthalassa

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The end-Triassic mass extinction (~201 Ma), one of the "Big Five" mass extinctions of the Phanerozoic, is estimated to have resulted in the loss of ~80% of known marine species. This interval is also characterized by a major perturbation to the carbon cycle, ocean acidification, and widespread oxygen deficiency within the oceans. While the specific causes of extinction and environmental changes are still debated, it is hypothesized that the event was triggered by massive volcanism associated with the emplacement of the Central Atlantic Magmatic Province. Despite the central role of sulphur in many of these potential mechanisms, little is known about what changes occurred in the sulphur cycle during this extinction event.

Here, we will present sulphur isotope data from pyrite ($\delta^{34}S_{pyrite}$), organic sulphur ($\delta^{34}S_{org}$), and carbonate-associated sulphate ($\delta^{34}S_{CAS}$) from sedimentary successions in Nevada, Alaska, and the United Kingdom to reconstruct the changes in the sulphur cycle over the end-Triassic mass extinction. Preliminary $\delta^{34}S_{pyrite}$ data from Alaska and the UK record large changes in local sulphur cycling. This appears to be linked to local bottom water redox conditions and organic carbon availability as tracked by iron speciation analyses and total organic carbon contents. $\delta^{34}S_{CAS}$ and $\delta^{34}S_{org}$ data will also be presented to track changes in the seawater sulphate reservoir and sulphur diagenetic pathways across the event.