

No significant sedimentary mercury enrichment during the onset of the Valanginian Weissert Event

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Sedimentary mercury (Hg), widely used as a proxy for volcanism, has been utilised to link environmental perturbations in the geologic past to Large Igneous Province (LIP) volcanism. The Paraná-Etendeka LIP (P-E LIP), for instance, has a temporal correlation with the Weissert Event (a global positive carbon-isotope excursion during the Valanginian) and a causal link was proposed based on the close stratigraphic association of normalised Hg spikes and the onset of the Weissert Event. Previously reported Hg data seem to suggest a potential perturbation of the global Hg cycle, however, these records are not unambiguous. Here, we generate new Hg data for the period spanning the Weissert Event in DSDP 534, DSDP 603, BGS 81/43, and Vergol section from Vocontian Basin, and employ Hg thermal desorption profiles (TDPs) and robust statistical techniques to test whether these records show evidence for Hg cycle perturbations related to volcanic activity. The Hg TDPs suggest that organic matter is the dominant phase in the examined sedimentary records, and we therefore, statistically correct the Hg records for enhanced loading from organic matter to obtain 'residual Hg'. Residual Hg shows an inconsistent pattern between different sites, particularly during the onset of the Weissert Event and the peak P-E LIP volcanic phase, and yields little evidence that the global Hg cycle was significantly perturbed during this time. The occurrence of anomalous Hg values outside the interval of P-E LIP volcanism further highlights the role of diagenetic and depositional processes in influencing the Valanginian Hg record.