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# End-Triassic – Early Jurassic LIP activity reconstructed using high-resolution Hg data from the new ICDP Prees core, UK

**OLIVER NEILSON**[1], ISABEL M. FENDLEY[1], JOOST FRIELING[2], TAMSIN A. MATHER[2], STEPHEN P. HESSELBO[3], HUGH C. JENKYNS[2], CLEMENS V. ULLMANN[3] AND MELANIE J. LENG[4]

[1]Pennsylvania State University
[2]University of Oxford
[3]University of Exeter
[4]British Geological Survey
Presenting Author: obn5031@psu.edu

The Early Jurassic was a time when important components of the modern earth system first emerged, such as the opening of the Atlantic and the rapid evolution of marine organisms. The latest Triassic and the Early Jurassic are of particular interest due to the environmental changes that occurred during this interval but it remains unclear what role large igneous provinces (LIPs) played in those changes.

As volcanism is the primary natural source of mercury to the environment, elevated sedimentary concentrations of this element have been widely used to trace volcanic degassing from subaerial LIPs. LIP activity coincided with the end-Triassic extinction but the timing of volcanism on the scale of ~$10^4$ years across the extinction horizon has not been resolved in detail as all current mercury records are of a relatively limited temporal resolution. In addition, there is little evidence of LIP volcanism at the time interval of the protracted carbon ($\delta^{13}C$) isotope curve that characterizes the Sinemurian–Pliensbachian carbon cycle (SPCC), here defined as the long-term (~5Ma) depression and recovery of $\delta^{13}C$ from the *Oxynotum* to *Ibex* ammonoid chronozones. The primary driver of this isotope trend remains enigmatic and no postulated non-volcanic mechanism has gathered traction.

The new core at Prees, Cheshire Basin, U.K. (ICDP JET project) offers a record to study the environment through the end-Triassic mass extinction to the SPCC. The core is characterized by the two events and a generally increasing $\delta^{13}C$ interval between them, a well-constrained chronology, and ancillary data.

To improve understanding of the carbon cycle perturbations and the environment as a whole, we present a new, high-resolution (~5ka through the events and ~25ka between them, spanning a total of ~15Ma) record of Hg concentration and pair this with XRF, total organic carbon, and organic carbon-isotope data. We use thermal desorption characteristics to identify and quantify changes in Hg speciation (host-phase) on a sample-level. Statistical analysis of covariation of other geochemical parameters with Hg data are employed in the interpretation of the Hg record. Together, these data allow us to resolve the volcanic impact on the Hg cycle through the latest Triassic and Early Jurassic.