



## **Temporal analysis of Early Jurassic large igneous province activity and its relationship to environmental perturbations**

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Volcanism in Karoo-Ferrar Large Igneous Province (LIP) is considered to be the trigger for major environmental changes in the Early Jurassic associated with the Toarcian Oceanic Anoxic Event and carbon isotope excursion (CIE), as well as the Pliensbachian-Toarcian Event and CIE. This environmental change is characterized by carbon cycle perturbations that affected the whole ocean-atmosphere system, as well as mass extinction in the marine realm. Significant work has been undertaken to understand the impact, absolute age and duration of these events in relation to LIP activity. Despite the plethora of vintage and recent geochronological datasets that have been generated for the large igneous provinces of the Early Jurassic, no rigorous statistical analyses of all of the published data have been undertaken to assess the temporal relationship between igneous province activity and environmental changes. Here we provide a compilation of over 200 ages for the entire large igneous province and statistical analyses of these ages. The analyses highlight peak volcanism in Karoo at the onset of the OAE and peak volcanism in Ferrar at the climax of the carbon isotope excursion that demarcates the OAE.