Volcanism and carbon cycling in the High Arctic during the Late Jurassic – Early Cretaceous

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Arctic carbon cycling and its regional climate have been observed to deviate from global trends in the Late Jurassic and across the Jurassic–Cretaceous boundary interval, but appear to recouple with global trends in the Early Cretaceous (Galloway et al., 2019; Jelby et al., 2020). We investigate the possible link between these observed trends and volcanism by examining the mercury (Hg) and other element records from Arctic sites in Svalbard (Norway) and the Queen Elizabeth Islands, Canada. We assess whether pulsed phases of the High Arctic Large Igneous Province, or the globally significant emplacement of Paraná-Etendeka or Greater Ontong-Java Plateau, are expressed by stratigraphic Hg trends recorded in the studied sites of Arctic Canada and Svalbard, and how any signals correlate with the regional stable carbon-isotope ($\delta^{13}C$) record. We compare these new data to Hg and $\delta^{13}C$ records from other globally distributed sites, focusing on the carbon isotope excursion (CIE) intervals: the Arctic-wide Volgian CIE (“VOICE”), the global Valanginian positive CIE (“Weissert Event”), and the global early Aptian CIE associated with Ocean Anoxic Event 1a (OAE1a).