

Close Encounters of the Ferrar Kind: exploring the impact of volcanism on Early Jurassic Environments

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The Early Jurassic (~183 Ma) was subject to abrupt and substantial disturbances to the global carbon cycle. The source of the perturbations is commonly considered to be the initiation of Gondwana break-up in the southern hemisphere marked by the presence of three large igneous provinces: Karoo, Ferrar and Chon Aike. Studies exploring the interaction of Ferrar igneous rock emplacement with the underlying sediment are limited although significant work to determine the age of Ferrar has been undertaken. In addition to the emplacement of intrusive volcanics in Ferrar, which may have resulted in the release of isotopically light carbon in to the atmosphere, Ferrar may also have contributed massive quantities of sulfur dioxide, hydrogen sulfide, hydrogen halides (specifically chlorine and bromine) and CO₂ to the ocean-atmosphere system, through Violent Erruptive Volcanism. Volatiles released in these eruptions may have caused ecological and environmental disturbances; these include global warming and cooling depending on the dominant governing climatic feedback mechanisms i.e. weathering, destabilization of methane reservoirs, intensified wildfire activity. In an attempt to better constrain the impact of Ferrar igneous activity on the Early Jurassic global carbon cycle we present new carbon isotope data, elemental geochemistry and mineralogical data from Tasmania examining the record of Ferrar intrusives and extrusive igneous activity and the contact underlying organic rich continental Triassic and Jurassic sediments.