PP53A-1105: Records of Triassic volcanism in Pangean Great Lakes, and implications for reconstructing the distal effects of Large Igneous Provinces

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13:40 - 18:00
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Documentation of the precise timing of volcanic eruptions in sedimentary records is key for linking volcanic activity to both historical and geological episodes of environmental change. Deposition of tuffs in sediments, and sedimentary enrichment of trace metals linked to igneous processes, are both commonly used for such correlations. In particular, sedimentary mercury (Hg) enrichments have been used as a marker for volcanic activity from Large Igneous Provinces (LIPs) to support their link to episodes of major climate change and mass extinction in the geological record. However, linking such enrichments to a specific eruption or eruption products is often challenging or impossible.

In this study, the mercury records from two exactly contemporaneous latest Triassic–earliest Jurassic rift lakes are presented. Both sedimentary records feature igneous units proposed to be related to the later (Early Jurassic) stages of volcanism of the Central Atlantic Magmatic Province (CAMP). These CAMP units include a small tuff unit identified by thin-section petrology and identified at 10 localities over a distance of over 200 km, and a major CAMP basalt flow overlying this tuff (and dated at 200.916±0.064 Ma) which is also known across multiple sedimentary basins in both North America and Morocco and is thought to have been emplaced about 120 kyr after the tuff. A potential stratigraphic correlation between Hg enrichments and the igneous units is considered, and compared to the established records of mercury enrichments from the latest Triassic that are thought to be coeval with the earlier stages of CAMP volcanism.

Investigating the Hg records of sedimentary successions containing tuffs and basalt units is an important step for demonstrating whether the mercury emissions from specific individual volcanic eruptions in the deep past can be identified in the geological record, and are thus important tools for interpreting the causes of associated past geological events, such as mass extinctions.

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