Do iron formations record periods of ocean plateau emplacement?

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Deposition of iron formations is associated with extreme greenhouse conditions (reflecting high pCO_2) and ocean anoxic events, and can be linked to mantle plume activity and emplacement of Large Igneous Provinces (LIPs). However, there are some major LIPs not matching in age with iron formations (such as the ca. 1267 Ma Mackenzie and 1110 Ma Umkondo events) and also some iron formations missing corresponding age matches in the LIP record. Other controls must have been in place to modulate the relationship between emplacement of LIPs and deposition of iron formations. One relevant factor is seawater composition and redox state, with oxidized conditions and high seawater sulfate content favouring removal of iron close to the hydrothermal sources in the deep ocean. A second factor is the depth of hydrothermal sources, with shallow-water level exhalations favoring more iron release to the ocean. We propose that emplacement of LIPs in a marine vs. terrestrial realm might have also played a critical control whether the association of LIPs with iron formation would be expressed or not. Impingement of a mantle plume onto oceanic crust results in formation of oceanic plateau, which would be later either dismembered and deformed in orogenic belts or subducted back to the mantle, and thus be poorly preserved in the pre-Mesozoic record. Oceanic plateaus that build to shallow-water levels might release large amounts of Fe and Mn into the oceans via submarine weathering of volcanics and might result in deposition of iron formations. On the other hand, LIPs that were largely emplaced onto continental crust may have had less influence on the deep-water redox conditions or composition and as a result not lead to deposition of large-scale iron formations. Considering that the record of ancient oceanic plateau is poorly preserved and largely lacking, large-scale, deep-water iron formations might provide a complimentary record of ocean plateau emplacement modulated by ocean redox state and seawater composition back through time.