

Characteristics of Phanerozoic sedimentary mercury records

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Sedimentary mercury has become a widely used tool to study the impact of subaerial volcanism and more specifically the emplacement of large igneous provinces on the Earth's surface environment. A large number of studies have generated mercury concentration data, and the collected data now covers a wide range of past periods and (paleo-)environments. As studies have dominantly focused on climate and carbon cycle perturbations or mass extinction events it remains largely unknown what role the (post) depositional environment plays in the expression of the sedimentary mercury record and its subsequent application as a proxy. We here examine the basic characteristics of >300 previously published sedimentary mercury records (>25,000 individual Hg analyses) across the entire Phanerozoic. The combination of lithological, paleo-environmental and geochemical data helps elucidate the role of depositional factors in driving sedimentary Hg variability. Preliminary results show that, similar to modern environments, the expression of the mercury signal diverges between successions. The main determining factors appear to be changes to the depositional environment, for example linking to coastal proximity, redox conditions and siliciclastic vs carbonate dominated lithologies. In addition, the application of common correction approaches to detect anomalies (e.g. Hg/TOC) potentially results in undesirable effects for the vast majority of successions (>85%). We will therefore discuss whether other standardization approaches, including those that take into account the influence of environment and age, might be useful in identifying Hg cycle perturbations associated with LIP emplacement.