# Multivariate analysis on geochemical data of the Cenozoic deep-sea sediments: A milestone toward deciphering the evolution of the pelagic realm through the Phanerozoic eon

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Deep-sea sediments are important record media of the changes in global climate, tectonics, and geochemical cycles, both in the present and the past oceans. From a different point of view, a certain type of sediment is enriched in industrially critical metals and thus expected as a promising resource in near future. For the purpose of clarifying the origin(s) of rare-earth elements and yttrium (REY)-rich mud, we have constructed a huge dataset of bulk chemical composition of deep-sea sediments from more than 100 sites in the Pacific and Indian oceans. By applying a multivariate statistical technique called independent component analysis (ICA) to the hemisphere-scale dataset, we extracted statistically independent components (ICs) that characterize the geochemical signatures in the Cenozoic deep-sea sediments. Moreover, by combining the ICs with depositional ages and reconstructed plate motions, we visualized the spatiotemporal variations of the ICs over the past 65 million years (Yasukawa et al., 2016). In the presentation, we will discuss the potential for the extension of the multivariate statistical approach to the accretionary complex that records the oceanographic information older than the Cretaceous.

Keywords: deep-sea sediment, multivariate analysis, independent component analysis, accretionary complex

 