

The origin of deep-sea sediments in the western North Pacific Ocean based on neodymium and strontium isotopic ratios

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Deep-sea sediments containing high concentrations of rare-earth elements and yttrium (REY), termed ‘REY-rich mud’, are widely distributed in the Pacific Ocean [1]. Moreover, the presence of REY-rich mud with an extraordinarily high REY content (more than 6,000 ppm in total REY) has been confirmed within the Japanese exclusive economic zone (EEZ) surrounding Minamitorishima Island, the Japanese easternmost island in the western North Pacific Ocean [2]. Although the deep-sea sediments in the Minamitorishima EEZ can be classified into several characteristic layers on the basis of major and trace element compositions [3], the origin of these sediment layers (sources, fluxes of element transport and processes of enrichment) has not been fully elucidated yet.

Here, for the comprehensive understanding of origin of the deep-sea sediments within the Minamitorishima EEZ, we report the downhole variation of (1) neodymium and strontium isotopic ratios and (2) bulk chemical compositions of major and trace elements through the piston cores collected at several sites within the Minamitorishima EEZ. The studied samples cover a wide range of variations in total REY contents, including surface non-REY-rich mud and the highly/extremely REY-rich mud within 10 m beneath the seafloor. Our new geochemical data characterize the individual sediment layers and thus provide essential constraints for their origin.

[1] Kato et al. (2011) *Nature Geoscience* 4, 535-539. [2] Iijima et al. (2016) *Geochemical Journal* 50, 557-573. [3] Nakamura et al. (2016) *JpGU2016 Abstract*.