Geochemical features and distribution of the extremely REY-rich mud in the Minamitorishima EEZ

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A recent report has documented a wide distribution of "REY-rich mud," deep-sea sediment containing high concentrations of REY (rare-earth elements and yttrium), in the Pacific Ocean [1]. Moreover, the presence of REY-rich mud (ΣREY = ~1,000 ppm) has been confirmed in the Japanese Exclusive Economic Zone (EEZ) surrounding Minamitorishima Island (Marcus Island) [2], on the basis of two sediment cores recovered from the Deep-Sea Drilling Project and Ocean Drilling Program sites.

To investigate a detailed spatial distribution of REY-rich mud in the Minamitorishima EEZ, the KR13-02 cruise (*R/V* Kairei from January 21 to 31, 2013) was conducted by JAMSTEC and the University of Tokyo, resulting in the discovery of the "highly" (ΣREY = 2000 – 5000 ppm) to "extremely" (ΣREY > 5000 ppm) REY-rich mud in the southern part of the Minamitorishima EEZ [3-5].

To clarify the mineralogical/chemical characteristics and distribution of REY-rich mud in the Minamitorishima EEZ, six research cruises (MR13-E02 Leg2, KR14-02, MR14-E02 Leg2, MR15-E01 Leg2 and Leg3, and MR15-02) have been subsequently conducted by JAMSTEC and the University of Tokyo over three years. A total of 54 sediment cores (typically ~12 m in length) were collected using piston corer during these cruises. Here, we report the visual core descriptions, bulk chemical compositions and the spatial distribution of the deep-sea sediments in the Minamitorishima EEZ.

[1] Kato et al. (2011) *Nature Geoscience*, **4**, 535-539. [2] Kato et al. (2012) *Abstracts with programs, the Society of Resource Geology 2012*. [3] Kato et al. (2013) *JpGU2013*. [4] Iijima et al., *in revision*. [5] Fujinaga et al., *in revision*.