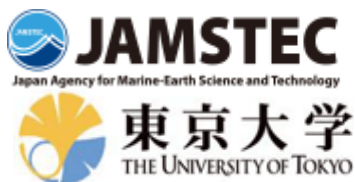

Press Releases



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JAMSTEC
School of Engineering, The University of
Tokyo

Discovery and distribution of mud containing very high concentrations of rare earth elements and yttrium around Minami-Torishima Island (Minami-Torishima Survey Cruise)

Overview

Dr. Katsuhiko Suzuki, Senior Researcher of the Submarine Resources Research Project of the Japan Agency for Marine-Earth Science and Technology (JAMSTEC: Asahiko Taira, President), and Professor Yasuhiro Kato, the Frontier Research Center for Energy and Resources, School of Engineering-Tokyo University (President, Junichi Hamada), and invited senior research fellow of the JAMSTEC Submarine Resources Research Project, analyzed mud samples that were collected from the sea floor around Minami-Torishima ([Figure 1](#): also referred to as Marcus Island) at depths of 5600 to 5800 m from a cruise in January, 2013, by the JAMSTEC deep-sea research vessel Kairei ([Figure 2](#)), and examined the vertical distribution of the rare earth element and yttrium (REY) concentrations in the sedimentary layers beneath the sea floor ([Figure 3](#)).

Data for this survey on the thickness and depth of the sediments containing the REY mud was efficiently acquired using the sub-bottom profiler (Seabed bottom profiling using sound) ([Figure 4](#)). The analytical result revealed sediments containing very high concentrations of REY (hereinafter "REY mud") with concentrations exceeding 6500 ppm (0.65%) at around 3 m beneath the sea floor ([Figure 5](#)); this REY mud is present at shallow depths within 10 m beneath the sea floor at multiple sites. The layers that contain high concentrations of REY mud registering in excess of 5000 ppm were found within 1 to 2 m below the upper limit of the existing REY mud.

The research results are expected to provide scientific insights into the distribution and abundance of REY resources around Minami-Torishima for future research and development. Later, more data will be added to the research results obtained so far, which will be scheduled to be presented at the Japan Geoscience Union Meeting 2013 in May.

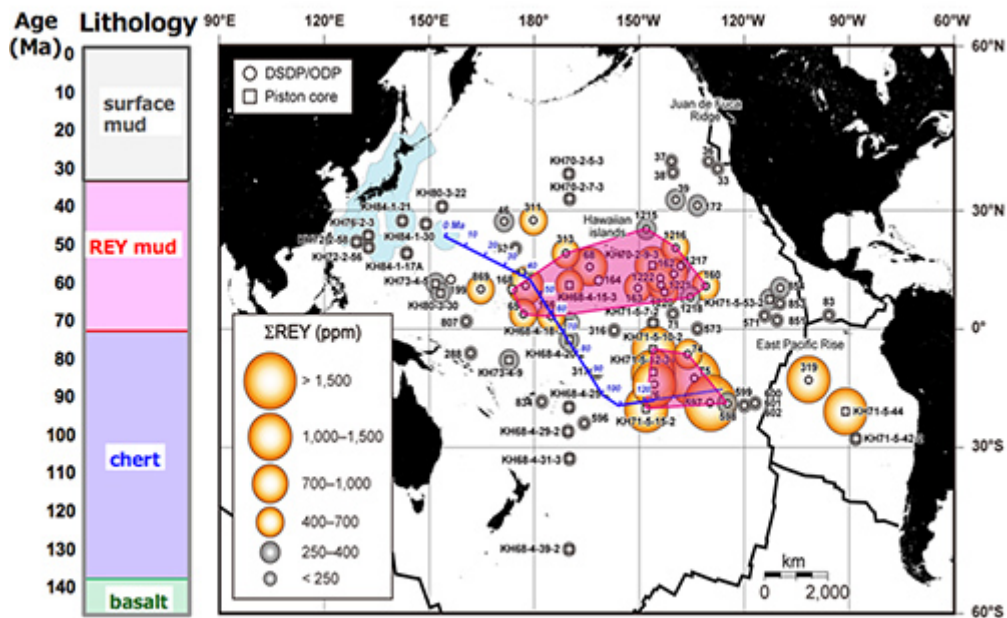


Figure 1. Cruise track (blue line in the map on the right) and expected geological stratigraphy (left panel) (modified from Kato et al., 2012)
 The orange and grey circles on the map represent rare earth concentrations. The pink areas indicate probable areas of high concentration REY deposits.

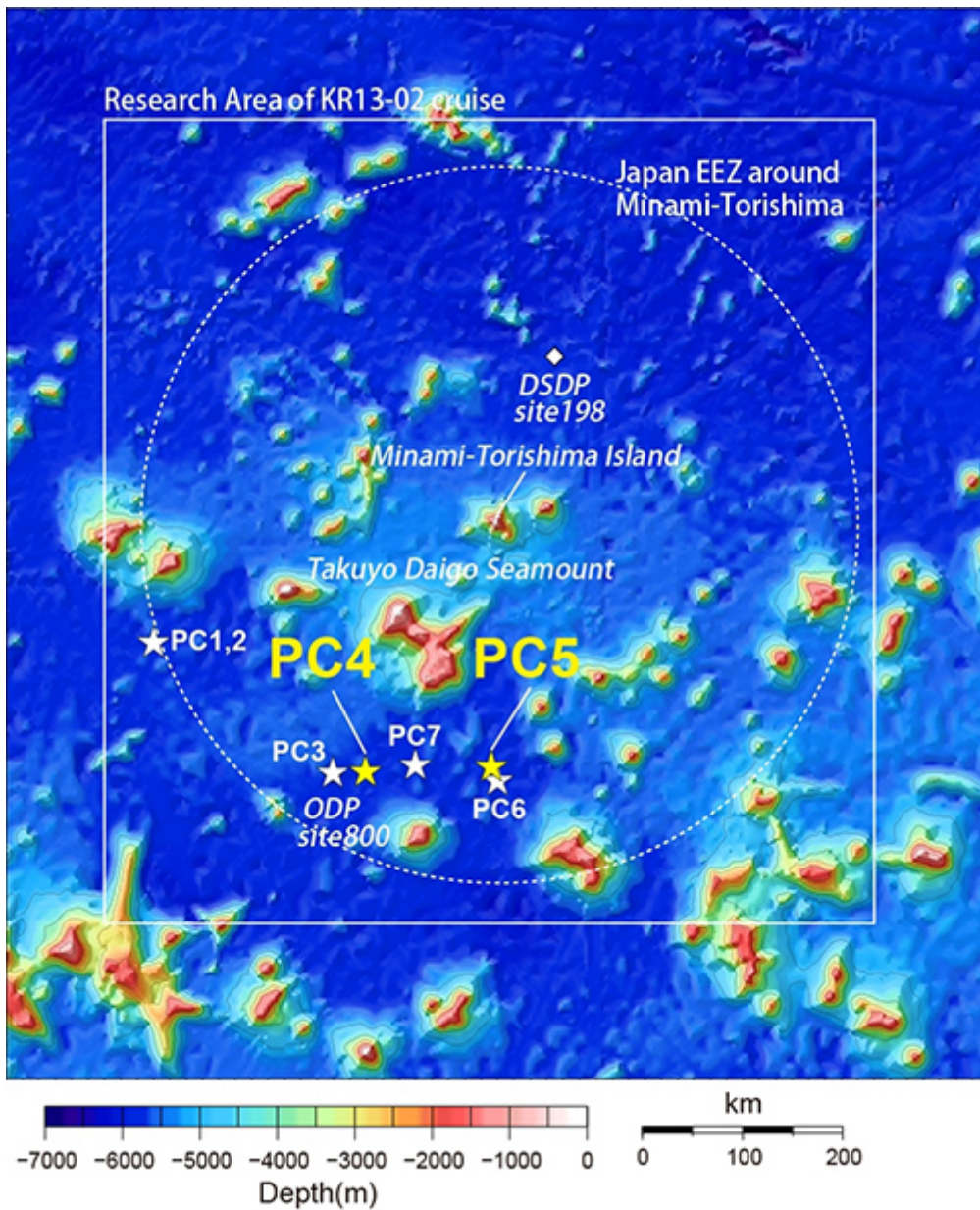
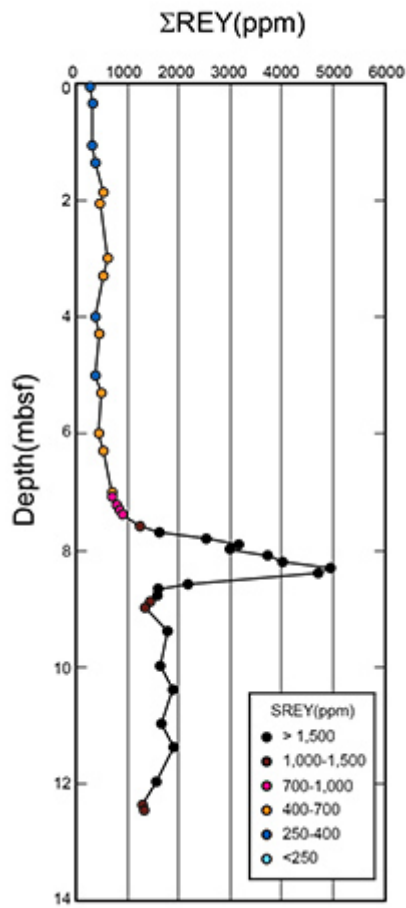


Figure 2. Piston core sampling site of the KR13-02 cruise



Figure 3. Sediment cores collected at points PC4 and PC5 shown in Figure 2. Sec.04 of PC4 and sec.02 of PC5 are dark brown clay with low concentrations of REY. Sec.09 of PC4 and sec.04 of PC5 are blackish brown clay with high concentrations of REY. O in Figure 4 mark the layers where the concentrations of REY are highest in each core.

PC04



PC05

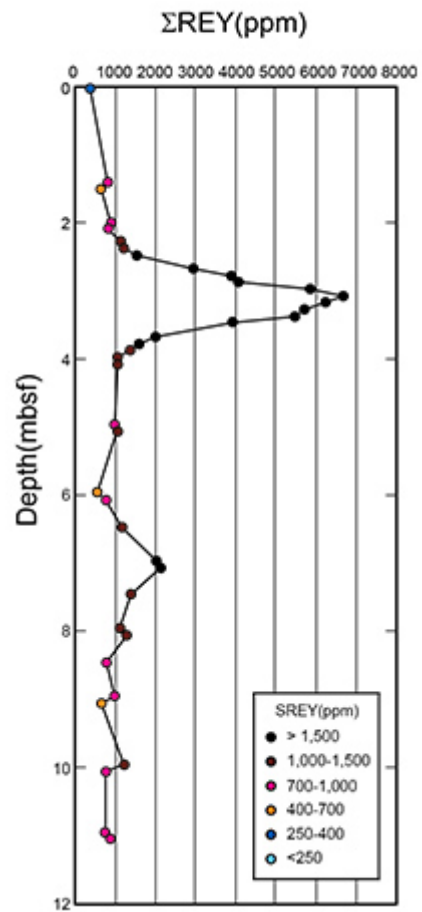


Figure 4. Depth profiles of the total REY concentrations of PC5 and PC4. PC04 has a layer of high concentration at a depth of around 8 m, and PC05 at around 3 m. At these two sites the high concentration layers are 1 to 2 m below where the REY mud first appears (dashed line).

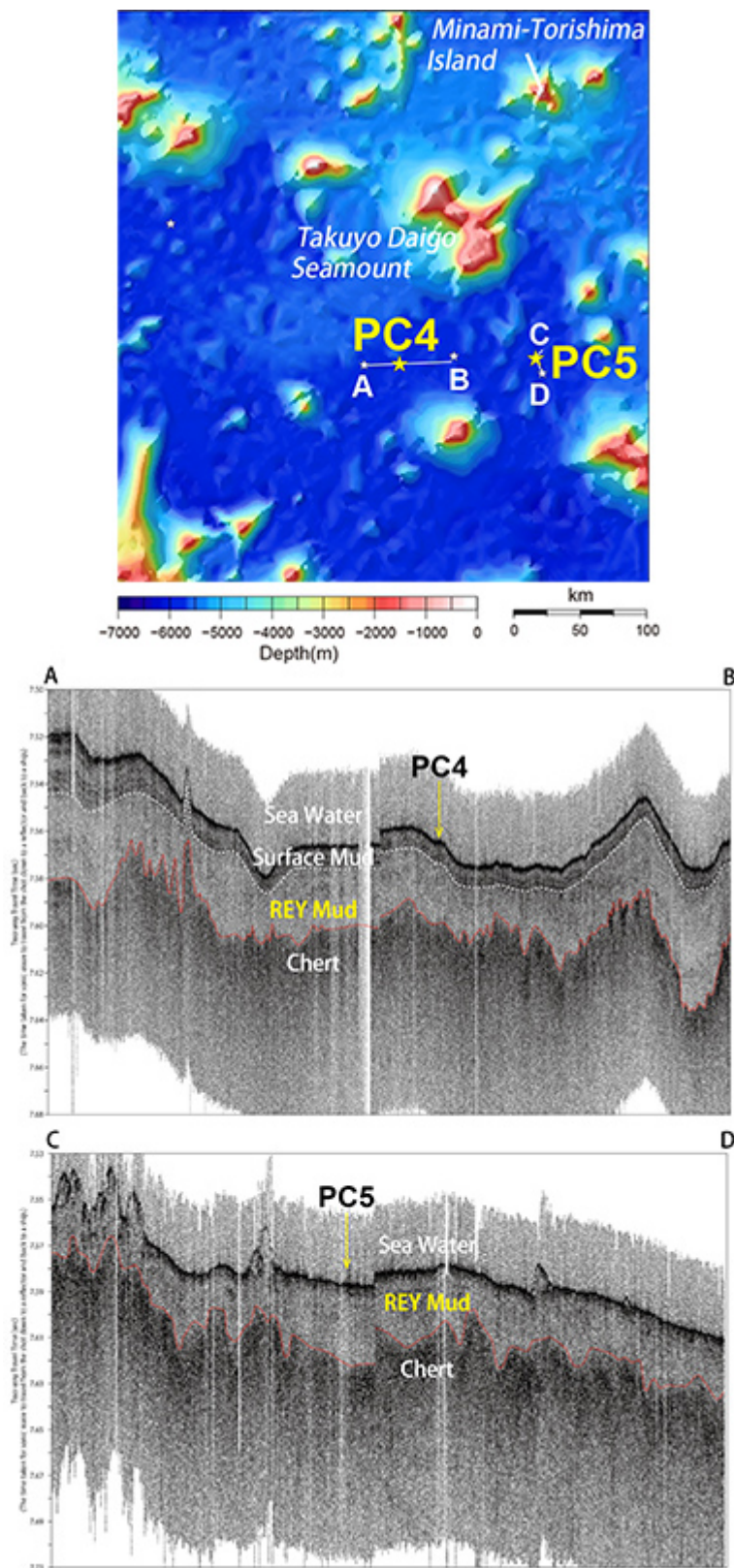


Figure 5. Images of the geologic structure below the seafloor at the points where PC04 and PC05 were collected as provided by the sub-bottom profiler. At PC04, REY mud was found between a clay surface layer and a bed of chert. No surface layer of mud covering the surface of the REY mud was found at PC05.

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