

# Ocean floor muddies China's grip on '21st-century gold'

July 3 2011, by Richard Ingham

---

China's monopoly over rare-earth metals could be challenged by the discovery of massive deposits of these hi-tech minerals in mud on the Pacific floor, a study on Sunday suggests.

China accounts for 97 percent of the world's production of 17 rare-earth elements, which are essential for electric cars, flat-screen TVs, iPods, [superconducting magnets](#), lasers, missiles, night-vision goggles, wind turbines and many other advanced products.

These elements carry exotic names such as neodymium, promethium and yttrium but in spite of their "rare-earth" tag are in fact abundant in the planet's crust.

The problem, though, is that land deposits of them are thin and scattered around, so sites which are commercially exploitable or not subject to tough environment restrictions are few.

As a result, the 17 elements have sometimes been dubbed "21st-century gold" for their rarity and value.

Production of them is almost entirely centred on China, which also has a third of the world's reserves. Another third is held together by former Soviet republics, the United States and Australia.

But a new study, published in the journal *Nature Geoscience*, points to an extraordinary concentration of rare-earth elements in thick mud at great

depths on the Pacific floor.

Japanese [geologists](#) studied samples from 78 sites covering a major portion of the centre-eastern Pacific between 120 and 180 degrees longitude.

Drills extracted sedimentary cores to depths that in place were more than 50 metres (165 feet) below the [sea bed](#).

More than 2,000 of these cores were chemically tested for content in rare-earth elements.

The scientists found rich deposits in samples taken more than 2,000 kilometres (1,200 miles) from the Pacific's mid-ocean ridges.

The material had taken hundreds of millions of years to accumulate, depositing at the rate of less than half a centimetre (0.2 of an inch) per thousand years. They were probably snared by action with a hydrothermal mineral called phillipsite.

At one site in the central North Pacific, an area of just one square kilometre (0.4 of a square mile) could meet a fifth of the world's annual consumption of rare metals and yttrium, says the paper.

Lab tests show the deposits can be simply removed by rinsing the mud with diluted acids, a process that takes only a couple of hours and, say the authors, would not have any environmental impact so long as the acids are not dumped in the ocean.

A bigger question is whether the technology exists for recovering the mud at such great depths -- 4,000 to 5,000 metres (13,000 to 16,250 feet) -- and, if so, whether this would be commercially viable.

In an email exchange with AFP, lead author Yasuhiro Kato, a professor of economic geology and geochemistry at the University of Tokyo, said the response from mining companies was as yet unknown, "because nobody knows the presence of the (rare-earth) -rich mud that we have discovered."

"I am not an engineer, just a geoscientist," Kato said. "But about 30 years ago, a German mining company succeeded in recovering deep-sea mud from the Red Sea. So I believe positively that our deep-sea [mud](#) is technologically developable as a mineral resource."

The market for [rare-earth elements](#) has tightened considerably over the last couple of years.

China has slashed export quotas, consolidated the industry and announced plans to build national reserves, citing environmental concerns and domestic demand.

These moves led to a fall of 9.3 percent in China's exports of [rare-earth metals](#) last year, triggering complaints abroad of strategic hoarding and price-gouging.

Japanese industry sources also said China temporarily cut off exports last year during a territorial row between Asia's two largest economies.

(c) 2011 AFP

Citation: Ocean floor muddies China's grip on '21st-century gold' (2011, July 3) retrieved 19 April 2024 from <https://phys.org/news/2011-07-ocean-floor-muddies-china-21st-century.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.