



THE RACE TO MARINE MINERAL RESOURCES

Marine mineral resources, long coveted but untapped because inaccessible, now seem within reach. Canadian firm *Nautilus Minerals* will embark on the adventure with the reception of the first deep mining ship, scheduled for 2017. The European Commission is also involved and publishes this month a comprehensive study on the state of knowledge in this field. The global race resumed.

A SEABED AS RICH AS IT IS UNEVEN

The abyss is full of mineral resources: iron, manganese, cobalt, copper, nickel, zinc, gold, silver ... Crusts, sulphides and other polymetallic nodules that contain them are distinguished both by their composition and their geological environment.

The nodules are formed from a core that can be microscopic, like shark tooth or rock debris ... The Clarion-Clipperton Zone located in the Northeast Pacific is full of these balls that contain 6000 times more thallium, three times more cobalt and more manganese and nickel than all terrestrial reserves. One problem remains: their extraction is done to hundreds, maybe even thousands of kilometres of any port treatment facility. Crusts form themselves by the deposit of cobalt and platinum on the funds of limestone or volcanic nature. Their growth is extremely slow, in the order of 1 to 6 mm per million years. Polynesia holds a cobalt treasure in its waters: 50 million tons of this ore have been estimated to lay between 1 500 and 2 000 meters depth. At the current global rate of consumption (88 000 t / year), this represents almost 600 years of resources. Finally, sulphides are produced by hydro-thermal activity: the water rushes into the breach created by underwater volcanoes and brings metals to the seabed. The 150 identified sites allow to consider them as the most promising type of mineralization due to their richness in base metals (copper, zinc, lead), precious metals (silver, gold) and rare metals (indium, germanium ...).

GEOPOLITICAL STAKES

This knowledge of abysmal mineral resources is the result of an international competition dating back over 40 years! France joined the race in 1970, around Polynesia and the fracture zones of Clarion-Clipperton. She rubs Western Germany, the USSR, Canada, Belgium, India, Japan and of course the United States. China, already interested from this period, will for a long time remain constrained by technological limitations. While this euphoria was stopped by the fall of commodity prices in the early 1980s, technological change and depletion of land resources, coupled with the explosion in demand for minerals from emerging nations are changing all that. By developing one of the most advanced manned submersibles, the Middle Kingdom joined the club of countries able to explore the depths in the 2000s. Canadian *Nautilus Minerals* seems very close to launch the industrial

exploitation of ocean resources in the exclusive economic zone (EEZ) of Papua New Guinea. Their first deep mining ship will be capable of carrying 400 tons bulldozers for extraction at a depth of 1600 meters.

A COMMON HERITAGE

On the high seas, however, the restricted club of the competitors must take into account the rules of the UN Convention on the Law of the Sea, including the legitimate right of least technologically developed and land-locked States to benefit from these resources. The International Seabed Authority (ISA) is in charge and issues exploration permits – as well as exploitation permits in the long term - for plots in an area that spans nearly 260 million square kilometres. While the pioneer countries retain an advantage due to expertise and high-performance tools - including ocean fleets - emerging countries are catching up and announce a merciless struggle to take control of the most promising sectors. Permits bloom since the early 2000s, both in the EEZ and in the Zone¹. Their renewal or change to business license - the first granted license will expire in 2016 - is a burning issue.

The European Commission is also examining the issue and trying to attract the attention of the old continent on the issue of deep mining, part of its Blue Growth strategy. In drawing up an inventory of its economic potential, legal framework and environmental impact, it aims to develop the tools necessary to develop this activity. Will Europeans take their place in this race?



« Abysses »,
Études marines n°8,
Juin 2015.

Available on our website:
cesm.marine.defense.gouv.fr

¹ Deep-sea Seabed whose mineral resources are governed by the ISA.