DEEP SEA MINING. A NEW FRONTIER FOR INTERNATIONAL ENVIRONMENTAL LAW

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Deep Sea Mining
A New Frontier for International Environmental Law

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Abstract — This paper intends to explore the main issues of the recent Deep Sea mining rush, which indeed raises huge strategic, geopolitical and environmental concerns. It notes that most of these concerns are significantly linked to the obvious insufficiency of international regulation regarding seabed exploitation. It concludes by stressing the need to implement as soon as possible a global regulation dimension under the Economic Exclusive Zone’s regime.

Keywords: International Environmental Law; Deep Sea Mining; Economic Exclusive Zone; Precautionary principle; Regulation; Ocean Governance; Competitive Intelligence.

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INTRODUCTION: RAISING AWARENESS ON DEEP SEA MINING DEVELOPMENT

Searches for alternatives sources of supply are ongoing since China, the predominant supplier of rare earth minerals, announced in September 1st, 2009 its decision to reduce its export quota. China, which controls about 97 percent of

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the market, allegedly restricted exports in order to conserve supplies for its own high-tech and green industries. The use of its monopoly as a political lever was brought in the broader public sphere in 2011, when it was used by China to put economic pressure on Japan during a territorial dispute over the Senkaku Islands. But the most important crash broke out on March 13th, 2012, when the United States, Japan and the European Union filed a complaint at the W.T.O. against China’s restrictions on rare earths exports.

These events have uncovered the alarming dependency of the high-tech and green industries and the rare earth minerals’ strategic dimension. This concern has pushed the global mining industry, policymakers and businesses to seek alternative sources of supply. Due to environmental impact and loss of technological know-how, the U.S. mining industry has been reluctant to re-entering the rare earth metals production. The European Union and Japan have similar constraints and much fewer possibilities for on-shoring the production of rare earth metals.

These data have prompted research of mineable deposits in developed countries or their periphery. As a result, massive deposits are being developed in Australia, in Canada and in the United States. Other countries have promptly joined this trend, such as Russia, Brazil, Mongolia, and especially India. The Japanese who consume one fifth of the global production are developing projects in Kazakhstan and Vietnam. South Korea has concluded a deal in order to exploit Bolivia’s lithium. The European Union and China have set their sights on the mineral resources of Greenland. Most recently India and Japan have joined hands to challenge China’s monopoly.

Research for alternatives to Chinese-produced rare earth minerals also reactivated Deep Sea mining projects. Interest for sea mineral wealth is not new. It actually began in the mid-1960s with the publication of a book by John L. Mero entitled Mineral Resources of the sea, which suggested there was unlimited supply of minerals contained in manganese nodules, potato-sized lumps or

4. See Politics & Economics of Rare Earths. Citygroup – Global Commodities Research, Columbia University, 2012, Jenik Radon (dir.)
7. See Takashi Fukuyama, Japan to produce rare earth with Kazakhstan to cut reliance on China, The Asahi Shimbun, April 30th, 2012.
9. See Leo Lewis, Rare resources key in power battle, The Times, Aug. 27th, 2010
10. See Fiona Harvey, Europe looks to open up Greenland for natural resources extraction, The Guardian, July 31st, 2012.
compressed sediment on the seabed abyss. The several studies launched at that time were abandoned due to the lack of profitability of Deep Sea mining. However, this situation could be reconsidered in view of the current rare earth metals crisis.

This new deal has also reactivated the research of new seabed deposits commercially exploitable. In 2011, Yasuhiro Kato, a Japanese geologist who led a study of Pacific seabed mud, published results indicating the mud could hold very rich concentration of rare earth minerals. According to that study the concentration of rare minerals seems to be very high: “deep sea mud contains high concentrations of rare-earth elements and yttrium at numerous sites throughout the eastern South and central North Pacific. We estimate that an area of just one square kilometer, surrounding one of the sampling sites, could provide one-fifth of the current annual world consumption of these elements.”

The impact of such a discovery could be significant regarding both China’s leadership on rare earths industry and its increasing geopolitical influence in this area. Obviously, countries bordering the Pacific are mainly concerned; even though the largest share of the potentially concerned area is probably located in the international seabed area – the so called “Area” – beyond the limits of national jurisdiction, then under the control of the Seabed Authority, set up under the 1982 United Nations Convention on the Law of the Sea (hereinafter U.N.C.L.O.S.). So far it has issued only eight licenses, all for exploration, not production, all for nodules, not massive-sulphide deposits, and all to governmental or quasi-governmental agencies (of China, France, Germany, India, Japan, Russia, South Korea and an east European consortium).

Initiated by the Japanese after China’s economic sanctions over Senkaku territorial dispute, the revival of Deep Sea mining projects has expanded worldwide. China and India have both launched important programs. Despite impressive challenges, Deep Sea mining projects are ongoing and their spreading seems inevitable.


14. See Internet website of the International Seabed Authority (http://www.isa.org.jm/en/home). It’s interesting to note that on February 1st, 2011, the Seabed Dispute Chamber of the I.T.L.O.S. rendered its first advisory opinion on the Responsibilities and obligations of the States sponsoring persons and entities with respect to activities in the Area and retained that States have a “responsibility to ensure” which is interpreted as an obligation for such states to “deploy adequate means to exercise best possible efforts to do the utmost, to obtain (...) that the sponsored contractor complies with the obligation under the convention” cited in Laurence Boisson de Chazournes, The International Tribunal of the Law of the Sea in The rules, Practices and Jurisprudence of International Courts and Tribunals, ed. by Chiara Giorgiotti, Martinus Nijhoff Publisher, 2012, p. 130.


Faced to the necessity to transfer technologies, to share revenues with the international community and the impossibility to obtain clear title to their holding and exclusive rights of exploitation, commercial miners have shifted their interest to the least developed island States' Economic Exclusive Zone (E.E.Z.). Thus, Papua New Guinea's Government has granted the world Deep Sea mining license to Nautilus, a Canadian company, who plan to operate in the Bismarck Sea.^{17}

It's important to notice this company has also its eye on the territorial water of Fiji, Tonga, the Solomon Islands, and New Zealand, which may also harbor commercially exploitable minerals. This race toward E.E.Z.s’ exploitation out of any clear framework is obviously a matter of great concerns.

The greatest fear would be this new industry expanding without being subject to any form of international supervision control or regulation. The dreadful precedent of the offshore oil exploitation evidences that it would be irresponsible to relinquish the regulation of Deep Sea mining industry under the sole responsibility of the private companies and the States involved. This regulation obviously involves stakes that exceed the framework of national policies.

The first part of this work deals with the inadequacy of the current international legal framework regarding Deep Sea activities and particularly Deep Sea mining. Changing this situation and introducing international regulation involves reconsidering the current conception of the law of the sea, which has remained focused on the sovereignty of coastal States.

The second part is related to the foreseeable issues of Deep Sea mining. Even though environmental protection is a vital challenge, the increasing strategic dimension of raw materials, especially some rare metals, might counter it. Geopolitical stake of the seabed control could all the more speed the rush to the abyss.

### I. INADEQUACY OF DEEP SEA MINING LEGAL FRAMEWORK

The E.E.Z. is usually considered as an extension of the State’s territory. Such a view tends to impede international regulation. The uncontrolled development of offshore oil and gas industry reflects this almost total lack of international regulation. It stresses the need to establish an international regulation based on the precautionary principle in order to avoid a haphazard development of the seabed exploitation.

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^{17} Nautilus would be the first company worldwide to commercially explore thigh grade massive sulphide deposits on the sea floor. In January 2011 Nautilus was granted a 20 years mining lease by the Government of Papua New Guinea for the development of the Solwara 1 deposit which lies in the Eastern Manus Bassin on the Bismark Sea at approximately 1600 metres depth. Nautilus planned to produce copper and gold in 2010. However, the company has been embroiled in a dispute with the P.N.G. Government under a shared funding agreement (http://www.radioaustralia.net.au/international/2012-11-14/nautilus-project-halted-over-dispute-in-png/1045884).
A. E.E.Z. Regime Impedes International Regulation

Since its recognition by the Geneva Convention of March 29th, 1958, prominence of the coastal State over the natural resources of the continental shelf – which is considered as an extent of its territory – has never been challenged. This prominence has even been strengthening through the creation of the 200 miles E.E.Z. under U.N.C.L.O.S. adoption in Montego Bay in December 10th, 1982. Coastal States have the “exclusive rights” to exploit, manage and preserve resources of seawater, and ocean floor beyond their territorial waters, up to 200 nautical miles from their coastline. Furthermore, E.E.Z. can be expanded under certain conditions (see hereinafter III C.).

Following Article 56 (1) (a) U.N.C.L.O.S., the term refers to an area where the coastal State has “sovereign rights for the purposes of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superjacent to the seabed and of the seabed subsoil, and with regard to the other activities for the economic exploitation of the zone, such as the production of energy from the water, current and winds”.

In this area, the coastal State shall conserve and manage natural resources. This requirement echoes the duty to ensure the protection and preservation of the marine environment referred to in Articles 192 to 237 U.N.C.L.O.S. Among these provisions Article 194-3 asserts that coastal States should limit the “pollution from installations and devices used of the exploitation or exploration of the natural resources of the seabed and the subsoil”.

According to Article 56 (2) U.N.C.L.O.S.: « In exercising its rights and performing its duties under this Convention in the exclusive economic zone, the coastal State shall have due regard to the rights and duties of other States and shall act in a manner compatible with the provisions of this Convention ». Indeed “sovereign rights” appear not to be absolute but circumscribed by the rules of international law of the sea. Thus, the coastal State does not have a plenary jurisdiction as may suggest use of the term "sovereignty".

For instance, coastal States must take into account the rights and freedoms of other States (Art. 72 § 2 U.N.C.L.O.S.) and do not affect other uses of the sea with respect to the waters and the airspace above them (Art. 78 § 1 U.N.C.L.O.S.). For example, the establishment of offshore platforms is normally prohibited in areas where there is intense fishing activity (Art. 147 § 2 (b) U.N.C.L.O.S.). Generally, the Convention seeks to find a balance between the rights granted to coastal States and traditional uses of the sea.

Despite the tensions caused by the increasing use of marine resources only a few international initiatives have been taken18. Ocean governance remains limited. Thus, these last years witnessed the spectacular development of offshore oil industry in a legal lacuna. Despite the high importance of the subject, the

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pollution resulting from exploration and exploitation of the seabed continues to spark little interest.

This kind of pollution is expressly referred to in Article 208 U.N.C.L.O.S. which requires coastal states to adopt laws and regulations in order: "to prevent, reduce and control pollution of the marine environment resulting directly or indirectly from the seabed." It means any activity or operation within the area under the jurisdiction of a State, that is to say the internal waters, territorial sea, E.E.Z. and the continental shelf.

The coastal State shall regulate in particular the E.E.Z. under its jurisdiction. In addition, § 4 and 5 of Article 208 U.N.C.L.O.S. require efforts to harmonize national regulations through international organizations, in order to avoid differences, which could be reflected by some States introducing more permissive standards than other.

Thus, States wishing to authorize mining activities underwater must first establish an appropriate legal framework. Then normally coastal State incurs responsibility in case of damage caused to the marine environment (Art. 304 U.N.C.L.O.S). However, even if the State is theoretically responsible for its E.E.Z.’s use, there is no binding provision to regulate its action in this regard. In fact, Article 208-5 U.N.C.L.O.S. invites only Parties to establish global and regional rules, standards and recommended practices and procedures to prevent, reduce and control pollution of the marine environment.

Despite limited international provisions, underwater activities remain principally regulated by the law of riparian States which can be very diverse. Obviously the regulation adopted within the International Maritime Organization (I.M.O.) – the specialized agency with responsibility for the safety and security of shipping and the prevention of maritime pollution – and regional seas agreements are notoriously insufficient. This explains the difficulty in resolving complex cross-border litigations as recently evidenced by a number of disasters associated with offshore petroleum activities.

B. The Worrying Precedent of Offshore Exploitation

To access what Deep Sea mining framework could be it is worth considering the situation of the offshore oil industry. Over a few decades, it has grown from a marginal status to more than one third of world production. In 2010, offshore provided 23.6 million barrels per day (mb/d) of oil, or 30% of world production and 2.4 billion cubic feet per day (Gm3/d) of gas, or 27% of world production.

It is clear that growth occurred outside of any international regulatory framework. However it seems that the improvement of technologies allowing drilling in ever deeper waters have not been accompanied by sufficient means to prevent and cope with accidents. Due to ever more extreme drilling conditions ever more extreme the risks on marine environment have considerably increased. The recent spate of accidents on offshore oil platforms has alerted public awareness on this issue.

On August 21st, 2009 following the explosion of a well on the Montara Platform located in the Australian E.E.Z. and operated by P.T.T.E.P., a Thai-
owned company, oil spilled into the Timor Sea and continued leaking during 74 days. The Australian Maritime Safety Authority (A.M.S.A.) reported a massive oil slick spread over 6,000 square kilometers of ocean killing the marine life, affecting waters under Indonesian jurisdiction. This oil slick reached a maximum size of 11,183 square kilometers. Results of the scientific monitoring studies on Montara oil spill showed its huge impact on the marine ecosystem.\(^\text{19}\)

A few months later, on April 20\(^{th}\), 2010, the Deepwater Horizon rig on the Macondo well in the Gulf of Mexico, exploded, caught fire and sank, making the world’s most serious oil release ever. After several failed attempts, the operator of the field, British Petroleum, finally regained control of the situation after 85 days and 4.9 millions barrels had been released into the ocean. By occurring in the US waters, the disaster gave rise to an avalanche of complex lawsuits and record compensations.\(^\text{20}\)

In June 2011 a series of spills occurred in Bohai Bay in the Yellow Sea. The Sino-American rig operating in Penglai 19-3 oilfield leaked a large amount of oil that covered an area of 840 square kilometers within a month. The Chinese State administration acknowledged the accident until one month after the beginning of the leak trying to cover the magnitude of the disaster. However in November the authorities admitted the leak have polluted an area of about 6,600 square kilometres and caused damage to coastal communities whose livelihoods depend on the sea.\(^\text{21}\)

These recent incidents – especially the Deepwater Horizon rig case – have marked the spirits and raised public awareness by the public on the significant risks of oil drilling operations in great depths.\(^\text{22}\) They have also thrown into sharp relief the insufficiency of the framework regulating offshore oil facilities and governing oil spill liability from such facilities.\(^\text{23}\)

Indeed, there are some anecdotic provisions enacted by the I.M.O. that apply to platforms. One of the very rare instruments that seeks to regulate pollution of the marine environment from offshore oil activities can be found in the 1990 International Convention on Oil Pollution Preparedness Response and Cooperation (O.P.R.C.) which addresses critical situations affecting the platforms.


\(^{21}\) See Wang Quiang, Bohai Bay oil spill lawsuits filed in US, Nov. 28\(^{th}\), 2012, available at [http://www.china.org.cn/environment/2012-07/03/content_25798492.htm].

\(^{22}\) See Julien Rochette, Toward an international regulation on offshore exploitation, Report on the experts workshop held at Paris Oceanographic Institute on March 30\(^{th}\), 2012, Working paper n° 15/12, IDDRI, Paris, France.

\(^{23}\) See For an overview of various international and national instruments see Mikhail Kashubsky, Marine Pollution from the Offshore Oil and Gas Industry: Review of Major Conventions and Russian Law (Part. I), MARITIME STUDIES, Nov.-Dec. (2006), 152; Shane Bosma, The regulation of marine pollution arising from offshore oil and gas facilities – an evaluation of current regulatory regimes and the responsibility of States to implement a new liability regime, 26, AUS. & N-Z. MAR. LAW JL., (2012).
However, regarding liability and compensation, there is a complete legal lacuna. In fact the Convention on Civil Liability for Oil Pollution Damage resulting from Exploration and Exploitation of Seabed Mineral Resources (C.L.E.E.) drafted in London in 1976 never entered in force. This is unfortunate because this tool set out the principles of a limited objective responsibility, compulsory insurance and the possibility to take an action against the insurer.

In order to remedy this legal lacuna, several regional initiatives have been launched. The more advanced among them are the 1992 Convention for the protection of the North East Atlantic (O.S.P.A.R.) and the 1976 Barcelona Convention – significantly revised in 1995 – which cover the Mediterranean Sea. Despite these initiatives the legal framework applicable to offshore exploitation remains woefully inadequate.

Several reasons can explain this situation. The reluctance of the very powerful oil industry is the most obvious one. Furthermore, it’s important to keep in mind that most of the international tools have been designed for pollution relating to oil transportation or its use as fuel by ships. In this regard it should be remembered that I.M.O.’s mandate deal only with maritime shipping. This explains why in April 2012 I.M.O. rejected Indonesia demand to put offshore drilling activities on its formal agenda, delaying the possibility for a global regime on liability and compensation for oil and gas accidents.²⁴

The Indonesian demand echoed the Montara oil platform disaster whose significant damages were not compensated due to the lack of transboundary agreements. This example highlights the need of an international convention on liability for exploration and exploitation of offshore oil.²⁵ A global regulation is indispensable because an oil spill caused by an offshore exploration or exploitation accident meets no boundaries and might occur anywhere. International regulation is essential to ensure that the polluter pays, not taxpayers in countries suffering the disaster.

Failure to impose such a framework for the offshore oil business is very worrying. It demonstrates the difficulty to impose international regulation and to resist the pressure of international companies. This is obviously a bad omen regarding the urgent need to establish a framework for deep-sea mining.

C. Enhancing the Precautionary Principle in Deep Sea mining Regulation

The international framework of Deep Sea mining activities is currently restricted to international waters. U.N.C.L.O.S. provided an International Seabed Authority, which finally came into force late, through the 1994 Agreement relating to the Implementation of Part XI (seabed provisions of the Convention). As stated previously, the strict requirements imposed in the international seabed

area and the lack of freedom of action, encourage States and mining entrepreneurs to focus on E.E.Z.s instead. In the current state of international law States exploit roughly their EEZ in the way they want. Up to now constraints laid down under UNCLOS have been mostly devoid of effectiveness.

However Deep Sea mining could make this situation change for several reasons. Firstly, because of the increasing public awareness on environmental issues. Secondly, because compared to offshore oil or gas industry, environmental risks are fundamentally different in nature. While in offshore oil or gas industry the environmental risk is mainly accidental, with Deep Sea mining it comes from the nature of the activity itself. In the first case, the risk is identified, whereas in the second case it is poorly understood and difficult to assess. The difference is significant: Deep Sea mining risk is not contained and its extent is just about unknown.

Obviously this kind of risk falls within the scope of the precautionary principle, which has had a global impact since the 1992 Rio Conference. It has become influential in many fields of international environmental law and central in the debate on climate change. Beyond that, the precautionary approach inspires public policy management especially in the context of sustainable use of natural resources. The well-known example is the fish stocks management.

While U.N.C.L.O.S. does not expressly refers to the precautionary principle it appears more or less explicitly in other more specialized conventions related to marine pollution. Moreover upon the formula of “prudence and caution” it is implicitly assumed by the jurisprudence of the International Tribunal for the Law of the Sea (I.T.L.O.S.). For instance, it was invoked against Japan by Australia and New Zealand in the 1999 Southern Bluefin Tuna case. In the absence of scientific certainty on how to ensure the conservation of this fish, the Court encouraged the parties to act with caution, without mentioning explicitly the principle and to take measures to avoid irreparable damage to existing stocks: “Considering that, in the view of the Tribunal, the parties should in the circumstances act with prudence and caution to ensure that effective conservation measures are taken to prevent serious harm to the stock of southern Bluefin tuna.”

Similarly, in the Mox plant case even if the principle was left for procedural reasons, I.T.L.O.S. referred to the obligation for the States “to cooperate” as a principle of international law recognized in the prevention of pollution of the marine environment: “Prudence and caution require that Ireland and the United Kingdom cooperate in exchanging information concerning risks

26. This point is however debated, some authors regarding Article 119 U.N.C.L.O.S. as providing for the utilization of the precautionary principle to the extent that the burden of the proof shifts in favor of conservation. Cited in Simon Marr, the The Southern Bluefin Tuna Cases: precautionary approach and conservation and management resources, EUR. JL. INT. LAW, 2000, vol. 11, n° 4, p. 824, note 44.

or effects of the operation of the Mox plant and in devising ways to deal with them, as appropriate.”

In the 2003 Strait of Johar case, I.T.L.O.S. settled a dispute related to land reclamation activities carried out by Singapore which allegedly breached Malaysia’s rights in and around the Straits of Johor. The Court considered the uncertainty of scientific knowledge leads the States to a “duty to cooperate” in order to avoid the negative consequences that could arise and prevent all forms of pollution: “Considering it cannot be excluded that, in the particular circumstances of this case, the land reclamation works may have adverse effects on the marine environment, (...) Considering that, given the possible implications of land reclamation on the marine environment, prudence and caution require that Malaysia and Singapore establish mechanisms of exchanging information and assessing the risks or effects of land reclamation works and devising way to deal with them in the area concerned (...) Directs Singapore to not conduct its land reclamation in ways that might cause (...) serious harm to the marine environment”.

At first glance, it might appear that I.T.L.O.S. apply the precautionary principle moderately. But it is necessary to consider that until today States had never been involved in activities whose risks are unidentified such as Deep Sea mining. Considering this new concern the unchallenging responsibility of the State regarding E.E.Z. management appears both anachronistic and objectionable in respect of the challenge of caring for the global environment. So, even though up until now it has been rarely challenged, this situation may change.

In fact, a more assertive enforcement of the precautionary principle seems inevitable. However, considering the offshore oil and gas industry precedent, it appears unlikely that the States will move spontaneously to the drafting of a convention with the aim to regulate Deep Sea mining activities. Alas, due to strategic and geopolitical issues linked with this activity the necessary environmental concerns could possibly be relegated.

II. RAISING COMPLEX GLOBAL ISSUES

Deep Sea mining perspective development obviously raises extremely serious concerns about its impact on the environment. As said, the main challenge is to prevent a haphazard development of the seabed exploitation by putting in place an international regulation that would oversee the States within their E.E.Z. But clearly, such a framework could be compromised because of the

increasing strategic dimension of some mineral resources, which could speed up
the rush, transforming the seabed control into a geopolitical stake.

A. Environmental Concerns on Deep Sea Activities

The rise in Deep Sea mining projects raises obviously serious concerns on
environmental issues. Sciences and industrials endeavor to find an acceptable
compromise in minimizing the environmental impact of the development of this
activity: “Many questions exist about the environmental sustainability of
underwater mining; public policies are under development to assess impacts,
protect ecosystems and distribute resource rents. These policies are as yet
inchoate, and oceanography may help shed light on the relevant questions,
thereby increasing the likelihood that seafloor mineral occurrences become
economic reserves.”

As stated, the effects of underwater mining are largely unknown and
require a precautionary approach. Specialists and conservationists are
nevertheless convinced that the removal of parts of the seabed will cause
disruptions in the benthic layer, increased toxicity of the water column and
suspended sediment residues. Removing parts of the seabed could cause
permanent disturbances into the habitat of benthic organisms, possibly depending
on the type of mining and location. Among these disturbances fine particles
resulting from the mining could have the greatest impact. They could cause
asphyxiation of several organisms. Depending on particles size and water
currents the plumes could spread over more or less extensive zones, possibly
having an impact on light penetration, zooplankton, which in turn could affect
the food chain.

The expected development of Deep Sea mining activities is a matter of
highs concerns for several reasons. The most obvious one is the fact that the most
promising resources – hydrothermal sulphides – are linked to a unique and rare
ecosystem. Drilling there might evidently disrupt newly discovered life forms,
such as for instance the famous giant tubeworms that thrive near the
hydrothermal vents. These luxuriant oases of life were discovered in the late
1970s in volcanic ridges, at depths of 1,500 to 4,000 meters. “Hot vents” are
home to an exotic biodiversity that live under extreme conditions in symbiosis
with the Deep Sea mineral environment and which is all the more valuable that it
is recognized as containing a very promising genetic resource potential. The
ecosystem is all the more extraordinary that its development is not based on
photosynthesis but on chemosynthesis.

30. Porter Hoagland and al., Deep Sea mining of seafloor massive sulfide, MARINE
POLICY, 34 (2010), 728. Interest on the topic is currently very strong as shown at the recent
symposium held in Shanghai entitled Marine Minerals: Finding the Right Balance of
Sustainable Development and Environmental Protection, The 41st Conference of the Underwater
Mining Institute, October 15-20th 2012 Tongji University.

31. See Erika Westley, Deep Sea mining is coming: Assessing the potential impacts,

32. David Kenneth Leary, International Law and the Genetic Resources of The Deep
Another significant concern is the fact that even the protecting regime of international waters – the so called “Area” – is quite incomplete. The “Mining Code” which has been developed by the I.S.A. is still not completed. It refers to the whole of the comprehensive set of rules, regulations and procedures issued by ISA to regulate prospecting, exploration and exploitation of marine minerals in the international seabed area. No progress has been achieved despite I.S.A. 2006 decision to make a priority of the enactment of a text relating to polymetallic sulphides. Indeed, although most sessions held in 2007 and 2008 were dedicated to this topic, a number of problem remains in discussion.

This lack of progress occurs in a context where the sustainability of consensus on international waters is not yet established. The U.N.C.L.O.S. conception of the seabed as the “common heritage of mankind” is not universal. Indeed it is important to keep in mind that the United States has not ratified U.N.C.L.O.S. and rather consider that “Deep seabed mining is a “high seas freedom” that all nations may engage in regardless of their membership or non-membership in U.N.C.L.O.S. or any other treaty. Like other high seas freedoms, the right to engage in deep seabed mining is inherent to all sovereign nations under customary international law. Rather, it is the convention that attempts to restrict access to the deep seabed and infringe on the intrinsic rights of the United States and other nations that have chosen to remain non-parties.” However, in the past the United States has secured its rights to mine the deep seabed through bilateral agreements with other deep seabed mining nations.

Beyond expected development of Deep Sea mining the growth of the industrial diving industries in general raises high concerns. These concerns culminate regarding the Arctic area which appears to be the new 21st century Eldorado for the major oil companies since the United States Geological Survey (U.S.G.S.) announced, in 2008, that 22% of the world's undiscovered oil and natural resources could be found in the North of Alaska, in Greenland and in Russian waters. This rush has been accelerated by the North Pole “maritimization” following the phenomenon of melting ice and therefore the release of passages in the Northeast and Northwest. As a result an increasing number of exploration contracts have been signed, particularly for the region of the Beaufort Sea (border between Alaska and Canada). The world’s largest oil


companies have been granted exploration and exploration licenses and currently compete in Greenland waters.\textsuperscript{36}

These concerns are all the more important that, as we have seen, not only there is no global regulation about the operating conditions of offshore drilling today but there is no more regional convention regulating the offshore oil activity in the Arctic. The establishment of a treaty similar to the Antarctic area dedicated to scientific research appears utopian.\textsuperscript{37} Considering the magnitude of the economic stakes, Coastal States (Russia, Canada, Norway, Denmark and the United States, etc.) will never accept the setting aside as Antarctica.

\section*{B. Mineral’s New Strategic Dimension}

The recent awareness of the depletion of natural resources has profoundly changed the status of some raw materials. A paradigm shift has occurred in their status. Some raw materials have got an increasing strategic dimension. For instance it is no longer possible to consider certain raw materials only through the prism of market logic. Such a shortsighted approach needs to be reconsidered. The case of rare earth minerals is probably the most emblematic in this regard. In just one decade, China’s monopoly of rare metals market has become a strategic issue.

As we saw previously, the strategic dimension of these rare metals comes from the fact that they are vital for the development of new technologies. They are an essential part of both high-tech and green-tech products and everyday consumer products, such as mobile phones, solar cells, wind turbines, lithium-ion batteries, fibre optic cables, synthetic fuels, catalytic converters, hybrid batteries, among others. Moreover many defence systems are rare earth dependant: guided missile systems, smart bombs, drones, advanced sonar, secure communications, advanced jet aircraft engines, advanced armor, advanced radars, stealth technologies and targeting and triggering systems.

China’s quasi-monopoly is certainly due to the low cost of labor and tolerance to highly polluting activities. But first of all it results from a long-term strategic vision. In 1992, the first secretary Deng Xiaoping prophesied: \textit{"The Middle East has oil, China has rare earths."}\textsuperscript{38} Six years before he launched the National High Technology Research and Development Program, which, according to China’s Ministry of Science and Technology, was established to help the country \textit{“to achieve breakthroughs in key technical fields that concern the national economic lifeline and national security; and to achieve leapfrog...”}\textsuperscript{38}
development in key high-tech fields in which China enjoys relative advantages.  

Indeed, countless examples can illustrate the fact that China has been pursuing a strategy of control of rare minerals production for a decade. Beijing seems to encourage Chinese companies to take control of foreign companies involved in the rare earths industry. As many observers have noted: «The Chinese government protects its State companies at home and supports them financially overseas. But these companies are essentially expected to be an arm of national foreign policy in their foreign investment, rather than to create value.»

This strategy is perfectly illustrated by China National Offshore Oil Co.’s attempt to acquire Unocal in 2005. There was a U.S. political storm over China taking out a large U.S. oil firm. The big media focused on the oil angle and paid very little attention to the fact that Unocal owned Molycorp, the only US company that produces rare earth metals in Mountain Pass mine. A similar attempt happened in Australia in May 2009 when State-owned China Non-Ferrous Metal Mining (Group) Co. bid to gain control of one of the world’s richest rare earth deposit owned by Lynas Corp. One month earlier, also in Australia, Jiangsu Eastern China Non-Ferrous Metals acquired 25% shares of Arafura Resources, a company engaged in the exploration of rare earths. A mine is to open in 2013 with an industrial production estimated at 20,000 tones, 10% of the needs of the planet. Still in 2009, China Investment Corp. (C.I.C.), a Sovereign wealth fund, acquired 17% of Tek Resources Ltd. Mining an important actor in Canada.

Beyond acquisition of mines, China’s industrial strategy targets also the industrial expertise. For instance after its acquisition in 1995 by two Chinese companies with very close ties with the Chinese government, the U.S. company Magnequench plant was completely dismantled and transferred from Idaho Falls to a newly constructed plant in Tianjin, despite the fact it was a manufacturer of automotive magnets based on rare earths used in military missiles. As a result the very specific knowledge of the tech-industry has been irretrievably lost and transferred to China.

After the low cost of labor has allowed the relocation of traditional industries in China, rare earths are used as a lever to encourage the relocation in China of research and technology industries. This transition from an economy

40. Maria Kielmas, China’s Foreign Energy Asset Acquisitions: From Shopping Spree to Fire Sale?, The China and Eurasia Forum, Quarterly 3, no. 3 (2005), 29
43. See Elisabeth Behrmann, China’s interest in Arafura Resources’ gains approval, The Australian, May 29 2009.
mainly based on the industry is at the heart of the economic development plan of China. Rare earths monopoly is used as a lever to achieve this goal. High-tech companies wishing to ensure a steady supply of rare metals are thus encouraged to relocate their production there, or to grant technology transfer. "With this program planned asphyxia, China is in a position to turn into a great power on the high-value segment of high-tech industries."  

The case of rare earths should be meditated as it highlights the lack both of industrial policy and strategic thinking of the most advanced countries: "The rest of the word was seemingly asleep as China grew to become a Goliath in the rare earth industry. It took the rest of the world nearly 20 years to suddenly wake up to the realization that the future of high technology could be in the hand of one supplier."  

Beyond rare minerals case trade tension around certain raw materials led to reconsider their status. Due to the phenomenon of scarcity, more and more raw materials have got a growing strategic dimension. This strategic dimension is no longer limited to commodities such as oil or uranium. Relations within producers States and consumers States shift from a simple logic market into a logic of sovereignty. Unlike China, most of the advanced States have neglected their industrial policy, unreasonably relying on the market to regulate strategic interests relating to sovereignty. 

Given the growing strategic importance of a number of minerals resources, in addition to those of energy resources, it seems obvious that the control of the seabed is increasingly becoming a major geopolitical stake.

C. Seabed Control as a Geopolitical Stake

The battle for control of the seas is obviously not new. Everyone remembers the 1982 war between Argentina and Unites-Kingdom for the control of the Falkland Islands whose seabed was supposed to contain important oilfields. Similarly, everybody is aware of the necessity to secure strategic places such as major commercial shipping lanes or places such as the Strait of Malacca or Suez or Panama canals.

For instance it is possible to examine the recent upsurge of tension on maritime fishing rights in South America. Colombia has recently announced that it did not recognize the jurisdiction of the International Court of Justice (I.C.J.) in terms of territorial boundaries, following a judgment granting at its expense a vast maritime zone. "The best interests of the nation require that territorial and maritime boundaries are established by treaty" and "not by the judgments of the International Court of Justice" stated Colombian President Juan Manuel Santos. A few weeks later, I.C.J. has started to deal with a similar dispute between Peru and Chile.

46. Olivier Zajec, Comment la Chine a gagné la bataille des métaux stratégiques, [How China Won The Battle of Strategic Metals], Le Monde diplomatique, Nov. 2011.
47. Cindy Hurst, China’s Rare Earth Element Industry: What can the West Learn?, Institute for the Analysis of Global Security, March 2010.
The development of this kind of litigation appears foreseeable in the coming years. The depletion of natural resources, the consequences of global warming and power struggles in historical areas of conflict encourage more coastal States to claim an extension of their exclusive rights, including operating and attempting to redefine certain maritime borders. This redefinition takes various forms. The main are the E.E.Z. extension procedures launched under U.N.C.L.O.S. In addition, several claims on maritime areas also arise in the context of more strained power and often very conflicting relationships between States.

Article 76 of U.N.C.L.O.S. gives States the option of extending coastal areas under national jurisdiction beyond the limits of the E.E.Z., where the continental shelf extends beyond the 200 nautical miles. In this case, the coastal State may request the extension of national jurisdiction up to 350 miles offshore; Article 77 of U.N.C.L.O.S. states that the extension includes the seabed and subsoil of the sea (excluding the superjacent waters). Thus, in the expansion zone, coastal States have sovereign rights. It should be noted that in these areas extending beyond 200 nautical miles, the State pays contributions in cash or in kind for the exploitation of these resources (Art. 82). After twelve years, the coastal State must pay royalties of up to 7% of the annual production value. The State that claims benefit of such an extension should be able to scientifically justify the extension of the continental shelf in this area. To do this, the coastal State makes a dossier justifying this extension request. A special commission, the Commission on the Limits of the Continental Shelf, examines it.

Beyond their technical nature, those proceedings of extension of the continental shelf are naturally imbued with a strong political dimension. In that they allow the extension of national jurisdiction of the coastal State, and thereby, strengthening its position in the region and the world, the extension procedures are a major strategic interest in management of rights of way and access to resources (fisheries, energy, and mining). Such strategic dimension is all the more significant that dependency on certain raw materials is on the rise. It will inevitably expand with expected increase in raw material prices and the hopes raised by seabed exploitation. This is made possible by the ongoing progress in offshore mining technique. E.E.Z. extension is all the more important that the exploitation of the subsoil of international waters seems highly unlikely in the long run due to a lack of consensus.

In addition to these U.N. extension procedures, maritime claims often lead to very high tensions between States. Currently two maritime areas are particularly coveted: the North Pole for economic reasons and the China Sea for geopolitical ones.

The North Pole has become one of the most disputed maritime areas in the world. The potentialities related to the melting of sea ice at the North Pole led riparian States to officially formulate more precise claims. Denmark estimated that the Lomonosov Ridge is an extension of Greenland. Norway, for his part, referred to the UN Commission on the Limits of the Continental Shelf (C.L.C.S.) a request for extension of its area 200 nautical miles in three areas of the Northeast and Arctic. Russia did the same. On August 2nd, 2007, during the highly publicized Arktika-2007 submarine expedition, Russia symbolically dropped a flag on the ocean floor, causing diplomatic tensions with the Canadian
Wealth revealed by melting ice then stirs envy. They needed to determine the legal nature of these new marine areas and to draw boundaries to avoid increasing tensions and political frictions. Other bilateral territorial disputes should however also be resolved, including those between Norway and Russia in the islands of Spitsbergen, the United States in Canada in the Beaufort Sea and Canada vs. Denmark on Hans Island. The Ilulissat Declaration, signed by the five riparian States on May 28th, 2008 de facto excludes three other circumpolar countries and the European Union authority over the region. The high stakes in the Arctic could also lead the United States to ratify U.N.C.L.O.S. to claim an extended continental shelf.

Beijing's strategic interests in the Pacific extend well beyond the borders of the South China Sea and its main stakes: the Paracel and Spratly southern islands, the Taiwan Strait and the Korean Peninsula. Not yet having a fleet capable of competing with the United States, the military component of this strategy is confined to the time the South China Sea that Beijing regards as its "inland sea". This space is in fact subject to a myriad of territorial claims between the riparian States of the region.

The explanation of these tensions lies in the fact that South China Sea is not only a vital thoroughfare for maritime international trade, but also because his basement contains large oil and gas resources. The epicenter of these claims remains the unresolved situation of Taiwan. Beyond the South China Sea, it is also the desire to counteract Taipei in its quest for international legitimacy that has led China to develop its famous "Chequebook Diplomacy" with micro States of the South Pacific.

The purpose of this policy is both to extend China’s influence and get privileged access to raw materials supply. From the early 2000 with the development of the Chinese industry, controlling sources of raw materials has become the main motivation of Chinese diplomacy. The priority is to secure the supply of industrial production tools whose spectacular growth is based on a strategy of production. Those imperatives explain the spectacular Chinese investment policy in the Pacific and some concerns related thereto. As a key

49. See Philip E. Steinberg, You are (not) here: On the ambiguity of flag planting and finger pointing on the Arctic, 29, POL. GEO., (2010), p. 81 s.

50. In addition to the conflict between China and Japan in East China Sea include those between: Japan and South Korea (Takeshima / Tokdo), Japan and Russia (Kuril Islands), China, Taiwan and Vietnam (Spratly and the Paracel). The Philippines, Malaysia and Brunei also have claims on these partial spaces. This area is particularly strategic for China because a new base of nuclear submarines is under construction on Hainan Island in the South. True to its strategy of occupation of the area in early 2010 Beijing announced its intention to develop tourism in the Paracels archipelago, while raising serious reactions from neighboring countries.

51. Like Japan in the 80s, China has embarked on a policy of development aid to small Pacific island States by providing funding for major projects (stadiums, office buildings) and by granting soft loans. Since 2006 an annual China-Pacific Islands economic development forum has even been held. The particularity of this funding diplomacy is that unlike Western countries China provides lending without conditions of good governance and ethical requirements, thus ignoring the so-called “Washington Consensus”. See Audrey Young, Chequebook brought out at Pacific Forum, The New Zealand Herald, Oct. 19th, 2007; Zhiqun ZHU, China’s New Diplomacy, Ashgate, 2010; Terence Westley-Smith, China in Oceania. New Forces in Pacific Politics, East-West Center, 2007.
player in the area since the Second World War, the United States has been strengthening their military and diplomatic presence.  

CONCLUSION: ENHANCING EEZ’S INTERNATIONAL REGULATION

Due to the depletion of land resources, exploitation of the mineral wealth of the sea seems inevitable. Because of the relative unavailability of international seabed areas, mining companies naturally turn to E.E.Z.s, which are almost completely dependent on the sovereignty of coastal States.

In this context, it’s feared that poor States owning offshore mineral resources are undemanding and agree an implementation of this new industry without precaution. Although scientists have uncertainty about their actual extent, it’s obvious that marine environmental hazards would be very significant. The risk to see this activity starting and developing outside of any international regulation is unfortunately not negligible. This fear reflects the fact that the provisions of U.N.C.L.O.S. relating to the protection of the marine environment are too vague and not actually binding on States as illustrated by the offshore oil and gas industry development.

In order to prevent the offshore mining industry from suffering the same fate, it would be necessary to introduce international requirements into E.E.Z.’s legal regime upstream before Deep Sea mining takes off. This would be a crucial step in Ocean governance’s strengthening. However, growing strategic issues related to the control of raw materials constitute a major obstacle. It is feared that the control of the bottom of the oceans shall become a growing geopolitical concern in the coming years.

52. On the military side, see Suan V. Laurence & David Mac Donald, U.S.-China Relations: Policy Issues, Congressional Research Service, August 2nd, 2012, p. 13 s. An example of strong diplomatic initiative to contain China’s growing influence has been given by the TransPacific Partnership Agreement (T.P.P.) that entered into force in 2006. This treaty, which has brought together some Key States in Asia-Pacific area, aims to be a viable pathway for realising the vision of a free trade area.