

Down Under the Sea

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A new issue has been added to the agenda of environmental concerns: the deep sea. The deep sea is still largely unexplored. Partly driven by the availability of ever more sophisticated research technology, partly by the possibility of making truly new discoveries, deep sea explorations are well under way. As it turns out the deep sea is anything but a dark freezing void. It is a diverse ecosystem providing a habitat for much more species than expected. At the same time, the deep sea may be under threat due to human activities in the previously largely undisturbed realm. Plans to open the first deep ocean mine (Solwara-1) in Papua New Guinean waters have put the issue of deep-sea mining on the international agenda. It is an exciting business opportunity to the industry and a potential source of revenue to some countries. The distribution of expected profits of deep sea mining was already a hotly debated issue during the drafting process of United Nations Convention on the Law of the Sea (UNCLOS) during the 1970s. To others, deep sea mining is an unacceptable risk. Deep sea mining is feared to negatively impact the unique ecosystem and to endanger the livelihood of coastal communities. An international NGO coalition has formed to lobby for a moratorium on deep sea mining. This paper sets out to trace the emergence of environmental NGOs mainly concerned with the deep sea. Second, the paper explores the struggle for the appropriate standard for deep-sea mining regulation. At the international level, the International Seabed Authority (ISA) is tasked to regulate and supervise deep sea mining activities. However, the actual mining of seabed resources is more likely to happen first in national waters. Here, the international codes of conduct do not apply. Do international regulations “trickle down” to the state level? Deep sea mining is an interesting empirical case because international regulations existed prior to national ones.

Discovering the Deep Sea

Since the early 2000s, concern about the state of the oceans was met with the creation of NGOs dedicated to the protection of the marine environment. While campaigning for marine issues is not entirely new on the agenda for environmental protection, there has been a notable increase in highly specialized NGOs in the past fifteen years. For instance, the Sea Shepherd

Conservation Society has been founded in 1977 and engaged in direct actions to preserve marine wildlife ever since. Similarly, anti-whaling campaigns were part of broad issue environmental NGOs but also became the sole cause of some specialized NGOs that eventually aimed at changing regulations at the international level (Epstein 2008: 139-64).

Yet it took some time until *the ocean* and/or *the deep sea* were perceived as an entire ecosystem in the need of conversation. The 1987 Report of the World Commission on Environment and Development had noted that the ocean lacked a strong advocacy voice. Some Canadian NGOs responded with celebrating the *World Oceans Day* for the first time in 1992 during the Earth Summit. *World Oceans Day* is now recognized by the United Nations; the UN had declared 1998 to be the *International Year of the Ocean*. This spurred the formation of NGOs with an ocean focus. For instance, a group of foundations established Oceana in 2001 in response to a commissioned report finding that only 0.5 per cent of all resources spent by environmental nonprofit groups in the United States went to ocean advocacy (Oceana website 2017). Oceana is an international civil society organization with several offices in the United States, Europe, South America and one in the Philippines. It presents itself as “dedicated to advocating for science-based fishery management and restoring the world's oceans (Oceana website 2017).”

Another US based organization carved out its niche in funding projects “dedicated to reversing the trend of destruction of ocean environments around the world” (The Ocean Foundation website 2017). The Ocean Foundation (TOF) was established in 2003 by individuals who engaged as professionals with marine ecosystems. They provide a platform to connect interested donors with projects. While the Ocean Foundation does not engage in campaigning it channels money and expertise towards protecting the marine environment. It offers consulting services to corporations, including research and publication support, for instance preparation of internal white papers as well assessing public opinion and international policy on marine issues. TOF also offers capacity-building to non-profit organizations.

Another initiative is the Global Ocean Commission which was launched in 2013. Alarmed by various trends in ocean degradation, former high-level politicians joined forces with business people to “address the failures of high seas governance” (GOC Message). They seek to suggest

an integrated regulatory framework for all activities in the high seas. There is also the International network for scientific investigation of deep-sea ecosystems (INDEEP) that is “dedicated to the acquisition of data, synthesis of knowledge, and communication of findings on the biology and ecology of our global deep ocean, in order to inform its management and ensure its long-term health” (INDEEP website 2017). The INDEEP network was established in late 2010 and unites some 500 members from 38 countries. Members are mainly life science researchers; the working groups are concerned with the deep-sea ecosystem. INDEEP was central for the creation of the Deep Sea Ocean Stewardship Initiative (DOSI) in 2013. DOSI explicitly aims engage experts from different backgrounds (Levin 2013). Its mission is to “seek to integrate science, technology, policy, law and economics to advise on ecosystem-based management of resource use in the deep ocean and strategies to maintain the integrity of deep-ocean ecosystems within and beyond national jurisdiction” (INDEEP website). Members of the network have called for better environmental regulation and management of seabed resources. These initiative now fulfil the advocacy role for better protection of the ocean. Noteworthy successes are the inclusion are conservation of oceans, seas, and marine resources in the list of sustainable development goals and this year’s first ever UN Ocean Conference.

For some of these NGOs, the main issue is deep sea mining. For this reason, NGOs have acquired observer status with the International Seabed Authority. The ISA is a treaty organization tasked with administering deep sea mining from the ocean floor in the areas beyond national jurisdiction. To date, 22 NGOs are observers to the ISA, most of which have just applied within the past five years for this status. Some of these are well-known environmental NGOs with a broad mandate like the World Wildlife Fund International. Others are actually large coalitions like the Deep Sea Conservation Coalition that unites some 70 environmental NGOs. Still other civil society observers to the ISA are representing interests of the mining industry. All of them hope for better access and more inclusion in the drafting of ISA regulations; yet formal access rights are rather limited. NGOs are allowed to attend the public meetings of the ISA Assembly and, upon invitation, to make statements. The actual

regulation drafts are prepared and debated in a different committee, to which observers have no direct access.

What is deep sea mining?

Deep sea mining is the technology to extract metal deposits from the sea floor. Initially, the assumption was that certain lumps of compressed sediment, called polymetallic nodules or sometimes manganese nodules, were the only occurrence of valuable metals on the seabed. Such lumps had been discovered in the late 19th century and collected by scientific cruises in the first half of the 20th century (Birney et al. 2006: 1). These nodules contain nickel, copper, cobalt, and manganese and are typically found in depth from 4.000 to 6.000 meters. As polymetallic nodules simply lie on the sea floor in certain areas, there is no need for actual mining in the sense of extracting the nodules from the ground but rather picking them up. The main challenge to removal has been the depth.

In the late 1970s, scientists started to distinguish ferromanganese crusts from polymetallic nodules. Ferromanganese crusts are rich in cobalt and nickel and also contain rare earth elements. These crusts form at the seabed on the surfaces of seamounts, ridges and plateaus in depth from 400 to 7.000 meters. The ones richest in metal can be found 800 to 2.500m deep in the central and western equatorial Pacific Ocean (Hein and Koschinsky 2014). As these crusts firmly adhere to the underlying rock, mining entails forcefully removing the ferromanganese crusts from their substrate rock. Developing a removal technology added another challenge to their extraction from the deep.

In the late 1970s, sulfide mounds were discovered near hydrothermal vents (Spiess et al. 1980). These newly encountered hot-water vents were later dubbed “black smokers”. As seawater seeps through the ocean crust into magma-heated rocks, metals are dissolved and rise with the super-heated fluids back up. Minerals make the venting fluid look like black plumes of smoke upon rising through openings in the seafloor. When mixing with seawater, precipitation of minerals eventually forms chimneys. The result are sulfide deposits containing copper, zinc, iron, lead, sometimes silver or gold as well as other trace metals (Hekinian et al. 1980). Metal

concentration in these deposits is very high in comparison to ores extracted from terrestrial mines. These so-called seafloor massive sulfide deposits (SMS) occur at mid-ocean ridges in depths from 1.400 to 4.000 meters. Mining seafloor massive sulfides is a question of separating the deposits from the seafloor and bringing the slurry up to the surface for further treatment. There are about 165 confirmed SMS sites (Boschen et al. 2013: 55). The world's likely first commercial deep sea mining project, Solwara 1, seeks to mine SMS deposits.

Solwara 1 Project

The Solwara 1 project site is located in the internal waters of Papua New Guinea. While lagging behind original schedules, the first private company is approaching the operational stage of a sea floor mining project. Nautilus Minerals Inc. (Nautilus) is has been granted the world's first deep-sea mining license and plans to commence resource extraction in the Bismarck Sea within a couple of years. At the advent of commercial deep-sea mining there is a high degree of uncertainty about the technology's impact. As it is a new technology any equipment needs to be newly developed and how the mining of one site affects the deep sea ecosystem can only be estimated. While it is quite obvious that the actual mining site will be severely damaged, the impact on the ocean floor farther off and the water column above is less clear. Long-term impacts can only be estimated but not based on specific data.

The applicable regulatory framework is the law of the Independent State of Papua New Guinea because every coastal state enjoys full sovereignty over its territorial waters. PNG is a Pacific island nation that gained independence from Australia in 1975. The country is the site of several large mines operated by Western companies. Its economy largely depends on mining revenues for export earnings; natural resource industry revenues also increasingly dominate its gross national product. At the same time, the population has not benefitted from macroeconomic growth. The country is ranked just below average even in the lowest group of the human development index, albeit slow and steady improvements (UNDP 2014). The vast majority of the population lives off farming in rural areas. PNG has experienced severe civil conflicts arising from mining operations. Especially local people and company security guards

clash frequently. In the Bougainville crisis, secessionist ambitions were also fueled by dissatisfaction over the distribution of mining revenues and mining induced environmental degradation. Any extractive resource company seeking to do business in PNG must be aware of the tense situation.

Yet the PNG government pursues pro-mining policies. According to national legislation, all minerals on, in, or below any land and in any water are property of the state. If a company is granted a mining concession, the lease-holder enjoys exclusive property rights during the term of the concession. However, state ownership of natural resources has been repeatedly contested by local communities who claim customary ownership. Usually the issue in these disputes is benefit sharing, though – not fundamental opposition to making the land available to mining activities.

However, there is local and, even more vocal, international opposition on principle to deep sea mining in PNG waters. One important driver is that the Solwara project is perceived to be a test case. The international NGO community is very mindful that the project's approval might turn into a blueprint for consecutive deep sea mining projects. A central concern is that the regulations set by a country with low regulatory capacity will become the world standard simply because it is the first project that has advanced to this stage. A campaign is likely to have the greatest impact before the project actually becomes fully operational. In light of uncertainty about the impact of deep sea mining, NGOs push for strict protection of the marine environment or even demanding to ban deep-sea mining. Without any doubt, Solwara is also a test case to the industry. There are other prospected sites considered to be economically lucrative. Moreover, other companies are interested to see how the first company undertaking such an enterprise fares.

While the opposition is broader, the Deep Sea Mining Campaign stands out because it was founded in response to exploration activities in PNG in 2011. DSMC is a project hosted by the Ocean Foundation and unites international, regional and local non-profit organizations concerned with mining, environmental protection, development, and rights of indigenous people. The membership mix illustrates very well the context of deep-sea mining. The visible

spokespersons of the campaign are either from Australia or Canada, some of them have experience in campaigning against terrestrial mining. The campaign seeks “to develop an active, broad-based and informed civil society response to deep sea mining in the Pacific region (DSMC 2013).” The organizers explicitly make note of the absence of comprehensive regulation while pointing out that regulatory frameworks are emerging as well as the model character of the South Pacific deep-sea mining projects. It is the uncertainty that creates a unique policy space and a window of opportunity to influence policy making.

Yet the campaign does not appear to aim at endorsing any specific standard for the regulation of the new mining technology. The aim is to ensure Free Prior and Informed Consent of local communities and the application of the precautionary principle. These two aims frame the issue of deep-sea mining as an issue of rights of indigenous people and an issue of environmental protection.

The local protest against the Solwara 1 Project in PNG is much harder to identify because it is less visible than the international campaign. Most visible are local actors that are already organized. For instance, the Lutheran Church has issued a strongly worded statement opposing the experimental technology. University students have also campaigned against the project. On the other hand, very many organizations listed as friends of DSMC are not local but from Australia and Canada. One anthropologist working in PNG has observed that local communities are concerned with social and economic issues rather than with environmental ones prior to commencement of mining operations (Macintyre 2007: 52).

The culturally highly divided society of PNG makes it extremely difficult to identify the community of indigenous people that hold customary ownership over land. There is no “first nation” or a handful of minority groups that are ethnically distinct from a majority group who are the descendants of Caucasian immigrants but rather an immense plurality among groups all indigenous to PNG. In addition, as any deep sea mining site is offshore, it is not obvious if a specific coastal community has a more legitimate claim to the site than another coastal community from a different island or any other group. The government does not contest customary ownership nor discriminates against certain culturally distinct communities.

However, PNG law claims all mineral resources for the central government. It is also up to the central government to decide how mining revenues are distributed within the country. Therefore, protests based on disenfranchisement of local communities are a moot point in the eye of the central government.

To date, PNG does not have any specific legal regulations with regard to deep-sea mining but has used the Mining Act (1992) by default to process the application of Nautilus for a deep-sea exploration license. Like in most countries, PNG mining laws are modeled to regulate land-based mining. There is an obvious regulatory gap to the extent that deep-sea operations differ from terrestrial mining.

The mining concession for the Solwara project was granted in 2011 under the existing Mining Act and is valid for 20 years. The PNG government had granted Nautilus an exploration license in 1997. In 2007 Nautilus conducted exploratory drilling to assess the resources at the Solwara 1 site. The site is expected to yield high-grade copper and gold deposits. Nautilus applied for a mining lease in October 2008 to the PNG Minerals Resource Authority, which was the first step to formally acquiring a permit. In late December 2009, PNG Department of Environment and Conservation granted the Nautilus the Environmental Permit for the Solwara 1 Project. This permit is valid for 25 years until 2035. In January 2011, PNG granted Nautilus the world's first deep sea mining lease for Solwara 1. The site is just one of a larger area hoped to hold valuable sulfide deposits.

Nautilus has commissioned scientific studies to gather knowledge about the ecosystem at the site as well as at sites considered sufficiently alike. The commercial interest in this particular maritime area has resulted in it being one of the best researched deep-sea ecosystems. Nautilus has provided the required environmental impact assessment. In addition, the company has commissioned the Earth Economics Institute to assess the environmental and social impact of the Solwara 1 Project. Earth Economics is a non-profit institute that seeks to quantify the value of the goods and services provided by regional ecosystems. Comparing the deep sea mining project to selected land-based copper mines, Earth Economics finds Solwara 1 to have “the

potential for far fewer social and environmental impacts than the existing terrestrial mines examined” (Schmidt and al. 2015).

The Deep Sea Mining Campaign has strongly contested the scientific validity of the research disseminated by Nautilus. DSMC has commissioned its own scientific reports on the sustainability of the Solwara 1 Project. They emphasize that there is not enough knowledge available to date to properly assess the impact of deep sea mining on a fragile ecosystem (Rosenbaum and Grey 2015). They further criticize the process of the environmental impact assessment as partial. PNG regulations only demand an environmental impact assessment but without further specifications. Since there are no detailed requirements to be met, it is at least unclear why a lining license is either denied or granted.

A recent review of PNG laws with regard to deep-sea mining notes several legal gaps involving consultation of and benefit sharing with local communities, waste management, mine closure, and protection of the marine environment (Molemaker et al. 2014: 84-96). However, PNG is in the process of drafting a body of regulations pertaining specifically to deep-sea mining. One concern of international environmental NGOs and from the development community is that countries with a weak rule of law and a general lack of expertise cannot make an informed decision. They fear such countries may inadvertently set low standards. Government officials and other stakeholders have participated in capacity-building workshops organized by a joint SPC-EU program. Currently the legislative process is on hold due to the national elections, which will be held from 24 June to 8 July 2017.

Possible Sources for Regulating Deep Sea Mining

It is still open to debate what the appropriate standard for regulating deep sea mining shall be. A few countries have recently developed specific laws on deep sea mining, yet not all governments likely to oversee such projects have yet done so. Even if such regulations exist, it is another matter if they provide a sufficient protection of the marine environment. As the new technology as well as knowledge on the deep sea ecosystem evolves, it is furthermore likely that

regulations may need to be revised. In addition, the ocean is one connected system. Different governance arrangements by different authorities may not be feasible. Thus it is worthwhile to ponder from which source such regulation could stem.

International State-Sponsored Regulations

The most important international treaty regarding the oceans is the United Nations Convention on the Law of the Sea. UNCLOS is an immensely broad treaty aiming to regulate all uses of the sea. With regard to deep sea mining, especially two functions need to be highlighted. First, UNCLOS divides the seas in five different zones establishing certain rights for coastal states and all other states specific to each zone. Within its territorial waters and Exclusive Economic Zone, the coastal state enjoys exclusive control over all natural resources. Economic jurisdiction includes the right to exploitation of the seafloor. Beyond these areas of national control, there are the high seas. All states enjoy equal rights and are entitled to a broad range of activities in the high seas. The ocean floor (and its subsoil) of the high seas are labeled “the Area”.

The negotiations of UNCLOS lasted almost a decade (1973-82) and were one of the main sites of the North-South divide. Many newly independent countries, organized in the Group of 77 and NAM, were striving for a New International Economic Order (NIEO). The negotiations experienced serious deadlocks and nearly failed over the question of exploitation of deep sea minerals (Swing 1976: 536-38; Blavoukos and Bourantonis 2011; Kirton and Vasciannie 2002). The central issue was the distribution of the expected economic benefits. On the one hand, mining sea floor resources was likely to diminish profits from land-based mining. At the same time, the necessary investments were prohibitively expensive for developing countries. The most likely investors were private companies rather than governments even in industrial countries. On the other hand, developing countries did not want to miss out on gaining access to the potential riches.

The highly controversial Part XI of UNCLOS deals with the Area. A new international organization, the International Seabed Authority, was created and given the authority to

govern the exploitation of resources in the Area. The actual mining was to be carried out by the so-called Enterprise. Eligibility for mining concessions ensured access for states and state-sponsored entities only and safeguarded opportunities for not yet developed economies. Especially the United States opposed restrictions on seabed mining and demanded free access to the Area for private companies. Part XI also establishes a system for sharing the financial burden as well as revenues and the transfer of technology. Objecting to this regime, the United States did not sign UNCLOS; other Western states did sign but stalled ratification.

After UNCLOS negotiations were concluded in 1982, another commission (Preparatory Commission, PrepCom) was established to specify the rather vague wording of Part XI of the Convention and bring the Authority and the Enterprise into existence (Brown 1984: 158-63). In the meantime, a small group of Western countries pursued national regulation of deep-sea mining outside of UNCLOS.

Eventually it turned out that UNCLOS was unlikely to be ever ratified if not substantial changes were made with regard to the regulation of deep-sea mining. Under the good offices of first the PrepCom Chairman and later the UN Secretary-General, several agreements and understandings marked some progress between the different country groups (Brown 1993). In the summer of 1994, the parties managed to bridge the ideological divide and concluded the New York Agreement. As a matter of fact, the agreement radically rewrites Part XI of UNCLOS discarding much of the complex bureaucracy and redistribution obligations of the original draft. Several provisions ensured that the newly agreed upon understanding on how to interpret and apply the original provisions were part of UNCLOS and to be treated as a single instrument from then on.

Following the New York Agreement, the International Seabed Authority held its inaugural meeting in November 1994 and became fully operational in the summer of 1996. The intergovernmental organization is mainly tasked with regulating deep-sea mining in the area beyond national jurisdiction. The mandate includes protection of the marine environment from mining-related harm, however, UNCLOS does not give the ISA a specific mandate to protect the environment. The ISA is also to promote marine research and to disseminate

research findings. Any other activities, even those with regard to the sea floor, for instance the laying of cables, are not included in the Authority's mandate. For now, the planned agent of the international community, the Enterprise, is non-existent. The ISA Secretariat is charged with carrying out its functions on an interim basis.

Despite the late start and difficult negotiations, ISA regulations on deep-sea mining are the most comprehensive set of rules that currently exist. Simply for this reason, they provide an important point of reference for any efforts of regulating deep sea mining. The Mining Code encompasses all the regulations, recommendation and procedures drawn up by ISA bodies. The regulatory framework is still emerging and largely untested as of yet. Subcommittees have drafted proposals while negotiations were still ongoing and some regulations have already been subject to revisions. There is a specific set of regulations applying to each type of mineral resource, i.e. one for polymetallic nodules that is different from the one polymetallic sulfides.

m I The first one is most developed since polymetallic nodules are the resource most likely to be mined first in the Area. This is most likely to happen in the Clarion-Clipperton Fraction Zone in the Pacific Ocean. Setting up regulations has advanced to the stage of an environmental management plan for this zone. The environmental management plan does not enjoy the status of a regulation, though. It is a recommendation of the Legal and Technical Commission to the ISA Council. This Commission is tasked with spelling out the details of the more general regulations.

Currently, protection of the marine environment is one of the central and most controversial issues. The Mining Code recognizes a precautionary approach to deep sea mining and the need for protection of the marine environment. References to a precautionary approach recall the Rio Declaration on Environment and Development. It is taken to mean that cost-effective measures to safeguard against irreversible environmental damage shall not be postponed due to lack of scientific certainty. At the same time, all ISA regulations emphasize the objective to facilitate the exploitation of seabed mineral resources. The key question is how much scientific knowledge is enough to proceed with exploration without causing irreversible harm to the

proposed deep sea mining sites? And who gets to define the baselines, the quality of scientific studies and their implications?

During the difficult negotiations of Part XI up to the New York Agreement, environmental protection has never been a controversial issue (Brown 1995: 12). However, once the ISA came into being and when it was clear that deep sea mining would be regulated by the Authority, state representatives and other interested parties turned their attention to the design of the emerging regulations. The turning point was the drafting process of the *Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area*. During the process, the precise wording and obligations with regard to environmental protection were among the most controversial issues (Le Gurun 2008: 227).

Detailed provisions offer guidance but also impose limits. Especially rules with regard to liability may impose unknown costs. The less knowledge there is about deep sea mining technology and its impact on the ecosystem, the harder it is to estimate the benefits and risks. On the one hand, the incentives for states to prefer soft regulation are high if states themselves are the entities to operate mining sites. On the other hand, if states sponsor private companies, states are likely to prefer stricter and more precise regulations to protect themselves against possible claims. Under the ISA regime, only states can apply for mining licenses, either directly or as sponsors of private companies. This diminishes the ability of states to shift responsibility easily to private actors for operational failures. However, if regulations set high standards, they may be too prohibitive to engage in the new technology.

Civil Society-Sponsored Regulation

Different civil society groups have also engaged in drafting proposals for the regulation of deep-sea mining or even adopted regulatory instruments. The *International Marine Minerals Society* (IMMS) is the most significant institution. This professional association was founded in 1987. Originating from a conference on underwater mining in 1970, a network of professionals interested in advancing the emerging technology came into being. Attendees from North America shared the latest research and business projects at annual meetings. Close

cooperation between academe and industry was explicitly encouraged as well as shopping for research grants, ship time, and jobs (Moore 1988: 4). Eventually the journal *Marine Mining* was created as a research outlet and the informal network evolved into a formal non-profit organization (Moore 1988: 7-8). The journal merged with another one in the early 1990s and has been published as *Marine Georesources & Geotechnology* since. The journal publishes research on seafloor resources and engineering solutions for recovering them.

The IMMS prides itself on a worldwide membership of individuals from industry, government agencies, and academic institutions (IMMS website 2017). The society aims to improve the understanding of marine mineral deposits within the global ocean, to encourage research and to interchange information. They still sponsor an annual conference. The 2015 technical focus was on underwater mining in shallow waters close to shores. 2015 was the first year that the Underwater Mining Conference was co-hosted by a company, Odyssey Marine Exploration, Inc, and the University of Hawai'i. All earlier conferences were presented by academic institutions only. Odyssey may be better known for historic shipwreck discoveries, but the NASDAQ listed company also holds ownership stakes in companies controlling exclusive mineral licenses for areas believed to contain high-value ocean floor mineral deposits (Odyssey 2015).

IMMS precedes the ISA and even UNCLOS negotiation process. Several US companies entertained the notion to commence ocean-floor mining in the mid-1970s (Shapley 1973: 849). It should also be remembered that the United States government had opposed the international majority opinion on how to regulate deep sea mining and is not party to UNCLOS. IMMS has entertained a hands-on approach to deep sea mining with many of its members excited about new opportunities. At the same time, the society lists "to encourage the prudent development of marine mineral resources, including concern for the environment" among its primary objectives (IMMS 2015). Indeed, the IMMS adopted a voluntary code for environmental management deep-sea mining in 2001. The Code for Environmental Management of Marine Mining has been the first regulation with regard to environmental

protection adopted in late 2001 and was revised ten years later. Interestingly, the founder and first CEO of Nautilus was the initiator of developing the IMMS code.

The voluntary Code enables companies to demonstrate a credible commitment to protecting the marine environment while engaging in a new technology. Compliance with environmental standards reassures governments and the public. Companies are able to claim they observe standards even though no specific national legislation is in place. Companies also benefit from guidelines in that they provide information about what is expected of them. At the same time, industry self-regulation may serve to preempt tougher governmental regulation and to deflect negative campaigns by environmental activists (Haufler 2001: 41). The IMMS Code acknowledges international law relating to the protection of the marine environment and (draft) ISA regulations. Its drafters have consulted national legislation and invited comments from experts, among them renowned marine biologists. The Code calls for the observation of the precautionary principle, sustainable development and public reporting on environmental performance. Yet it does not prescribe detailed practices and specific reporting standards. In any case, the Code is an exercise in standard setting.

Conclusion

As deep sea mining seems to progress to commercial operations, the need for detailed regulations arises. While a secluded ISA committee has been working on such mining codes for a long time, civil society became aware of the issue only recently. The pending economic feasibility of extracting ocean floor resources occurs at the same time that the conservation of the world's oceans has emerged as an environmental concern. A number of specialized NGOs now endeavor to protect the deep sea ecosystem. As deep sea mining technology is just being developed, a window of opportunity exists to strive for appropriate standards ensuring the protection of the marine environment. Yet as protests against the Nautilus' mining project in PNG illustrate, it is highly contested if sufficient scientific data is currently available for making reliable assessments.

All currently available standards call for the protection of the marine environment and can even agree on applying the precautionary principle. However, it is not clear what that entails in detail. For example, Nautilus has argued it has diligently applied the precautionary principle in commissioning numerous studies, striving for high standards, and proposing to “renaturalize” its mining sites after exploitation. In contrast to Nautilus, the Deep Sea Mining Campaign takes the precautionary principle to mean that the new technology should not be used if there is no evidence that it does not harm the marine environment. Since late summer 2014, the network campaigned for a moratorium on deep sea mining. The petition has been distributed through an internet platform and signed by over 650,000 persons when it was handed over to the ISA a year later in 2015. It demands the ISA to prioritize conservation and the rights of coastal communities as well as more openness in the debate.

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