ISA environmental management, and potential interactions with OSPAR High Seas Marine Protected Areas

Document intended for OSPAR - Madeira II workshop

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Foreword

Following the designation of six High Seas Marine Protected Areas (HSMPAs) in 2010, the OSPAR Commission aims at drawing management plan for these areas.

For that purpose is going to take place in January 2012 in Paris the second informal meeting of competent authorities on the management of selected areas in Areas Beyond National Jurisdictions (ABNJ) in the North-East Atlantic, also known as the Madeira II workshop.

Contrary to the Marine Protected Areas (MPAs) we are used to deal with in national jurisdiction, these HSMPAs do not have a managing authority, and therefore the idea of management relies more on a cooperation of sector-based authorities.

Bearing in mind this idea, the present document is intended to feed the workshop by pointing out the interactions between the existing environmental management of the International Seabed Authority (ISA or the Authority) and the protection of the selected areas.

Institutional background and mission

ISA is an autonomous international organisation that administers mineral resources in the Area (ISA's website).

ISA has been established under the 1982 United Nations Convention on the Law of the Sea and the 1994 Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea (see in particular part XI, section IV : the Authority).

ISA exercises its authority, on the States Parties to the Convention and on the activities related to the resources of the seabed and ocean floor and subsoil thereof beyond the limits of national jurisdiction (the Area), in particular

A principal function of the Authority is to regulate deep seabed mining and to give special emphasis to ensuring that the marine environment is protected from any harmful effects which may arise during mining activities, including exploration (ISA's website).

The Authority, which has its headquarters in Kingston, Jamaica, came into existence on 16 November 1994, upon the entry into force of the 1982 Convention. The Authority became fully operational as an autonomous international organization in June 1996.

ISA has agreed with the OSPAR Commission a Memorandum of Understanding in 2010, and the two organisations have a reciprocal observer status.

Geography

As mentioned above the Authority administers mineral resources of the seabed in ABNJ, what is called the Area (**Figure 1**).

The figure 1 shows an outline of the Area (as well as information on sulphides and hydrothermal vents).

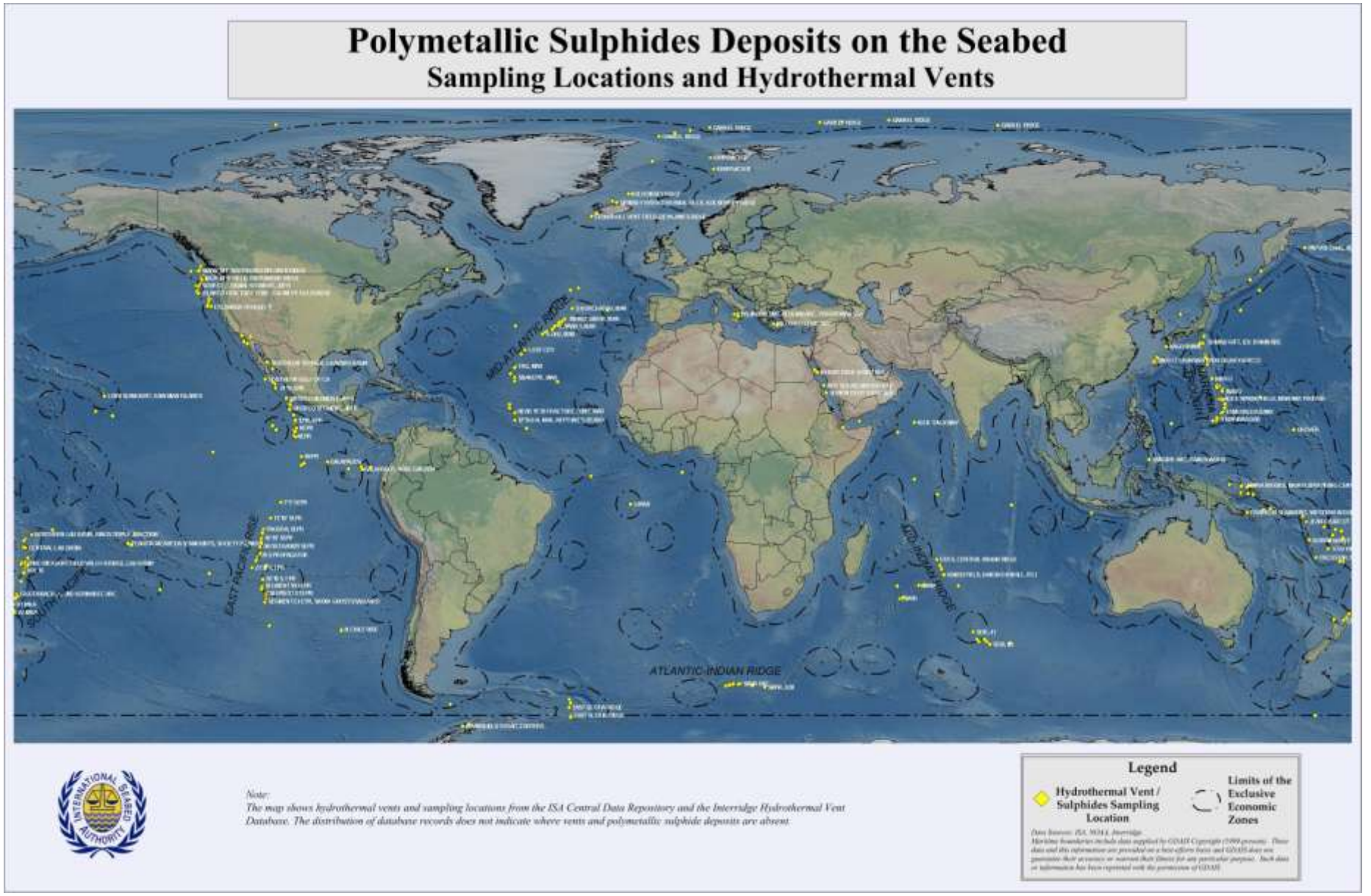


Figure 1: the Area

Management of the resources

Overview

As we said before, ISA is responsible for administering the minerals resources of the Area, including prospecting, exploration and exploitation activities for those resources. As part of its responsibility is the management of the impacts of these activities on the environment. More precisely this management shall aim to *prevent, reduce and control pollution and other hazards to the marine environment, including the coastline, that have the potential to interfere with the ecological balance of the marine environment* and to *protect and conserve the natural resources of the Area*.

The Council

Provisions for the Council are given under the article 162 of the UNCLOS.

The **Council** is "the executive organ of the Authority", and in particular this responsibility encompasses the environmental management of mining activity. Namely, the Council administers :

- The delivery of exploration or exploitation contract,
- The supervision and control of mining activities,
- The revision and the adoption of the Regulations on mining activities,
- Emergency measures in case of environmental threats arising unexpectedly.

The legal and Technical Commission

Provisions for the Legal and Technical Commission are given under the article 165 of the UNCLOS.

The **Legal and Technical Commission** of the Authority is in charge of making the recommendations on the protection of the marine environment.
This Commission performs the review of applications for plans of work, supervision of exploration or mining activities, assessment of the environmental impact of such activities and is also responsible to provide advice to the International Seabed Authority's Assembly and Council on all matters relating to exploration and exploitation of non-living marine resources (such as polymetallic [manganese] nodules, polymetallic sulphides and cobalt crusts).
The Commission has also developed the Regulations on prospecting and exploration for polymetallic nodules, sulphides and cobalt-rich ferromanganese crusts in the Area (approval still pending for the last one).

Contracts for mining activity

The Authority is entitled to set out two types of contracts for mining activities : exploration and exploitation contracts. These contracts can be signed by the Authority either directly with States, or with state-owned enterprises or with private companies supervised by a sponsoring state.

Exploration contracts

Notification of Intention to engage in Prospecting

Any prospector having the intention to undertake prospecting activities should submit to the Secretary-General a *Notification for prospecting,* to which the Secretary-General should answer within 45 days. If the notification meets the requirements of the Convention and these Regulations, the prospector is recorded in a register maintained to that purpose.

Application for approval of a plan of work for exploration to obtain a contract

This first step is quite formal, and the main debate rely on the *Application for approval of a plan of work for exploration to obtain a contract* that any potential prospector should submit to the Authority, in order to be examined by the Legal and Technical Commission at its annual session.

The application contains several parts concerning legal and financial issues, but also two sections where environmental management is addressed :

- Financial and technical information (section III) where the applicant shall explain how the technical options prevent from serious harm to the marine environment,
- The plan of work for exploration (section IV), where the prospector shall detail in its work plan the way he will address, assess and minimise environmental impacts of extraction activities

If the LTC considers that the application fulfil the requirements of the Regulations, the Council approves the plan of work for exploration, and a **contract for exploration** between the Authority and the applicant is prepared and generally signed within the 6 following months.

Exploration phase

The activities authorised by the contracts for exploration are framed by the respective Regulations on exploration (link here). Among others, the Regulations entail a whole section on the **protection and preservation of the marine environment** (section V, articles 31 to 34).

These contracts duration extend over 15 years divided in three phases of five years. Before the start of which the work plan for exploration of mineral resources needs to be reviewed, in particular the prospector shall address in detail the planning of its activities for the next five years (for the first phase the plan of work is included in the application for the immediate five-year period).

The prospector shall also **report annually** on its mining activities, addressing in particular the environmental impacts of the extraction and the on-going developments to mitigate those impacts.

Under the Regulations, each contractor has the exclusive right to explore an initial area of up to 150,000 square kilometers. Over the first eight years of the contract, half of this area is to be **relinquished**.

The exploration contract is the essential condition to apply for an exploitation contract.

Exploitation contracts

They must follow the 15 years of exploration, and there are subjected to a separate application. The regulations for these contracts are still under development.

Logically as the exploitation contracts cannot start before the end of the 15 years of the exploration phase, which for the firsts started in 2001 (Figure 2), such contracts cannot be expected before 2016.

Reserved areas

As the Figure 3 points out, it is important to note the existence and the extent of **reserved areas.** These areas are saved for ISA's activities or for potential future application of developing countries (for instance the applications of Nauru and Tonga presented in figure 2). They are not protected areas.

Mining activities in progress

The Figure 2 gives an overwiew of the current situation of the mining activities under contracts.with the Authority.

At present, the two resources actually covered by contracts are polymetallic nodules and polymetallic sulphides. These contracts are only for exploration, and then regulated by the respective regulations on prospecting and exploration for polymetallic nodules in the area (respectively sulphides), set up by the Legal and Technical Commission.

Eight (and soon nine) out of ten (and soon twelve) of the exploration areas are in the Central Pacific Ocean south and southeast of Hawaii with, in the well known **Clarion-Clipperton zone** (Figure 3) ; one is in the middle of the Indian Ocean and one is in the Southwest Indian Ridge.

Date	Resource explored	Organism	Country(ies)	Geographic zone	Area's name	Surface (km^2)
2001	Polymetallic nodules	Yuzhmorgeologiya	Russian Federation	Pacific Ocean	Clarion-Clipperton	<150,000
2001	Polymetallic nodules	IOM	Bulgaria, Cuba, Czech Republic, Poland, Russian Federation, Slovakia	Pacific Ocean	Clarion-Clipperton	<150,000
2001	Polymetallic nodules	Government of Korea	Korea	Pacific Ocean	Clarion-Clipperton	<150,000
2001	Polymetallic nodules	COMRA	China	Pacific Ocean	Clarion-Clipperton	<150,000
2001	Polymetallic nodules	DORD	Japan	Pacific Ocean	Clarion-Clipperton	<150,000
2001	Polymetallic nodules	IFREMER/AFERNOD	France	Pacific Ocean	Clarion-Clipperton	<150,000
2002	Polymetallic nodules	Government of India	India	Indian Ocean	Mid-Indian Basin	<150,000
2006	Polymetallic nodules	BGR	Germany	Pacific Ocean	Clarion-Clipperton	149,976
2011	Polymetallic nodules	NORI	Nauru	Pacific Ocean	Clarion-Clipperton	74,830
2011	Polymetallic sulphides	COMRA	China	Indian Ocean	Southwest Indian Ridge	10 000
2011*	Polymetallic nodules	TOML	Tonga	Pacific Ocean	Clarion-Clipperton	74,713
2011*	Polymetallic sulphides	Ministry of Natural Resources and the Environment	Russian Federation	Atlantic Ocean	Mid-Atlantic Ridge	10 000

Figure 2 : Contracts of exploration delivered by ISA

*Exploration plan approved but the contract is not signed yet.

AFERNOD : Association française pour l'exploration et la recherche des nodules (French Association for Exploration and Research of Nodules).
BGR : Bundesanstalt for Geowissenschaften und Rohstoffe (Federal Institute for Geosciences and Natural Resources). German Geological Survey.
COMRA : China Ocean Mineral Resources Research and Development Association
DORD : Deep Ocean Resources Development Co. Ltd.
IFREMER: Institut français de recherche pour l'exploitation de la mer
IOM : Interoceanmetal Joint Organization
NORI : Nauru Ocean Reserves Inc
TOML : Tonga Offshore Mining Limited

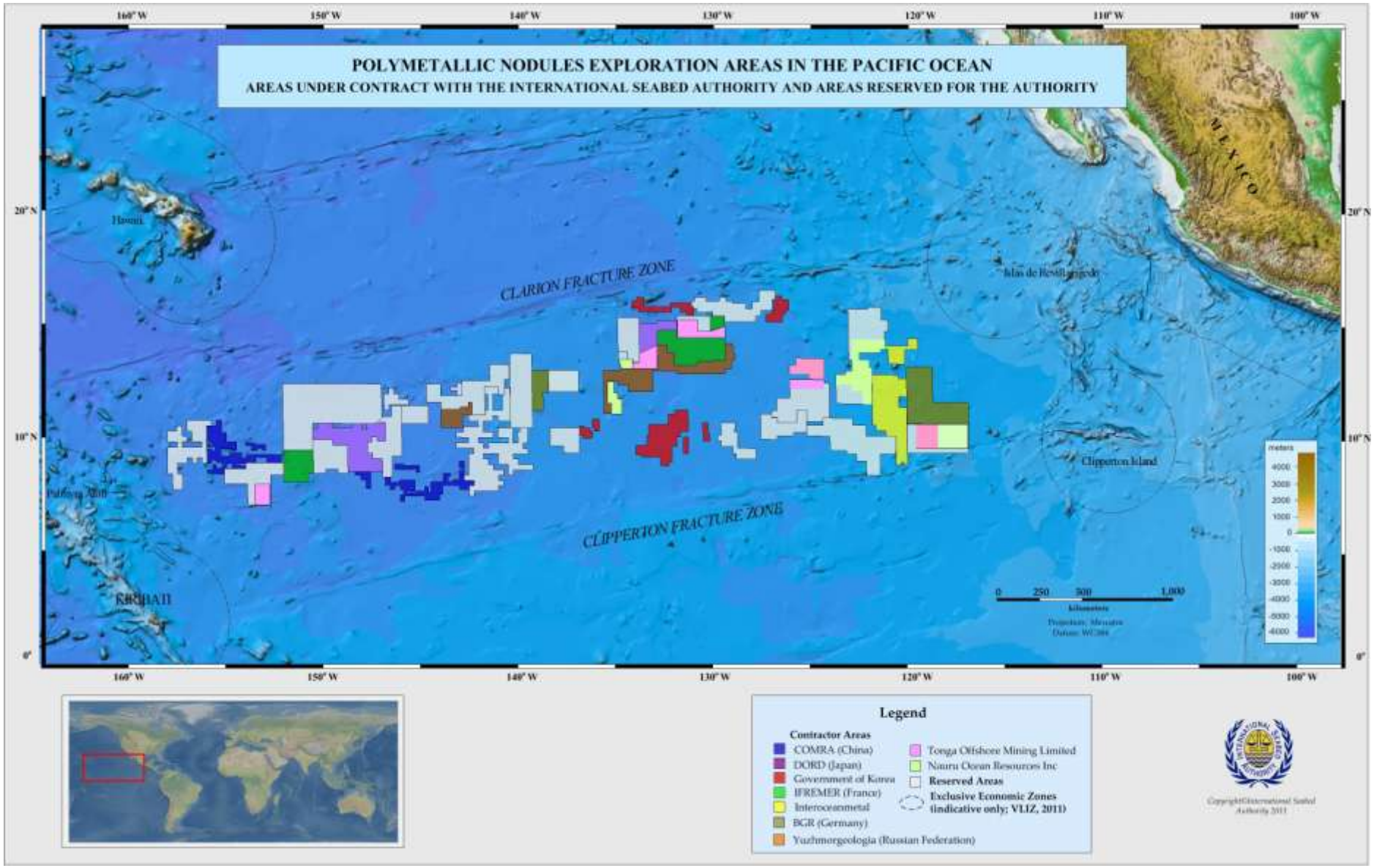


Figure 3 : mining activity in the Clarion-Clipperton zone (ISA maps)

Management in the northeast Atlantic

To date no mining activity occurs in the North east Atlantic part of the Area. So regarding the OSPAR HSMPAs, we can say that ISA has currently no management activity.

Therefore the scope of the present document, by relating what is undertaken in the areas of mining activity, is more to foresee the global context in case of mining activity in the OSPAR part of the Area.

We can note, as the Figure 2 shows, that the first exploration contract in the Atlantic is about to be signed as the exploration plan of the Russian federation has been approved by the Legal and Technical Commission in 2011. This plan concerns polymetallic sulphides. It should be noted that France will apply in 2012 for exploration of polymetallic sulphides in the Atlantic Ocean as well (south of the Russian contract, so outside of the OSPAR region too).

Of course, nothing impedes in the future to see exploration activities in the northeast Atlantic, but as we see on the map (Figure 4), the northeast Atlantic does not seem to be the most crowded area in terms of mineral resources. This last point might be challenged by new discoveries as the knowledge on high seas mineral resources remains partial and the scientific research is regularly providing new information.

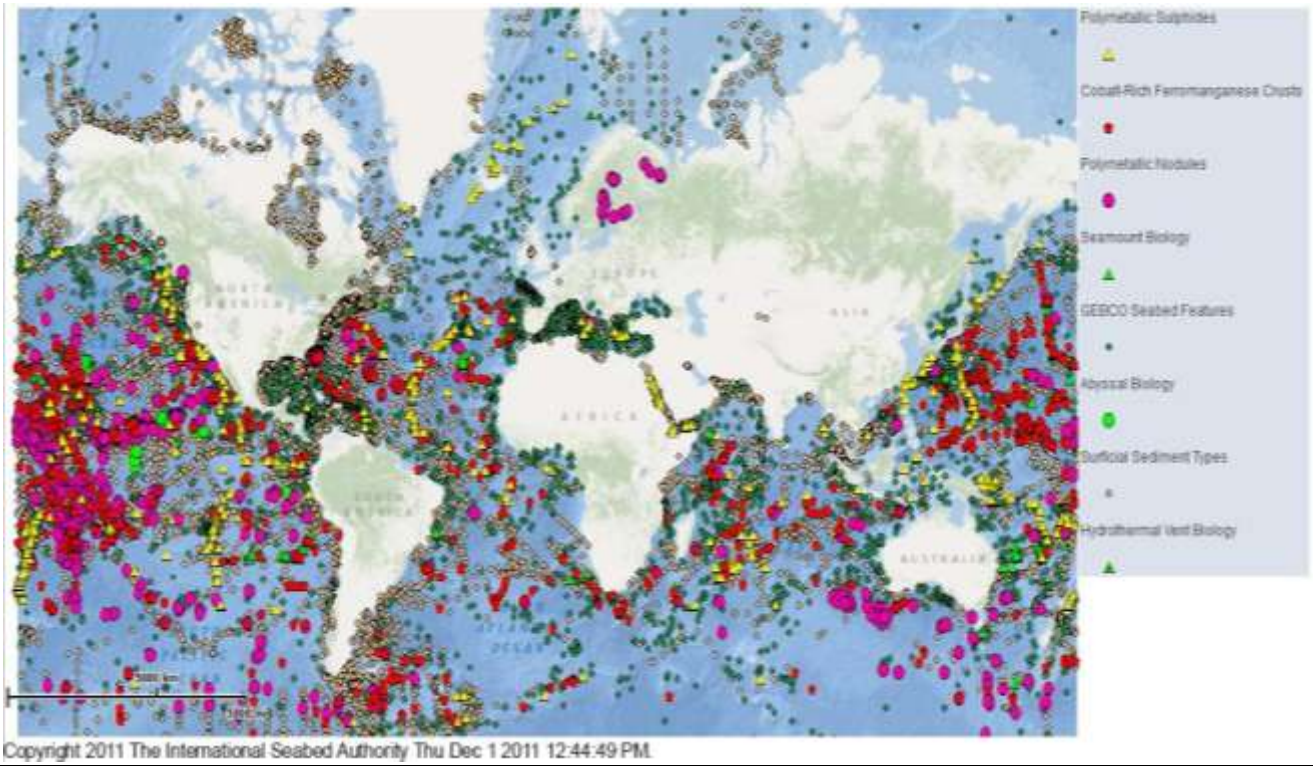


Figure 4 : deep seabed resources (from ISA web GIS application)

Description of mining operations

The basic mining operations include: (a) picking up the polymetallic nodules and separating them from the fine-grained seabed muds that host them; (b) lifting them 4,000 to 5,000 metres to the ocean surface; and (c) separating them from the seawater and sediment entrained in the lift operation and transporting them to a metallurgical processing facility.

Each of those steps is likely to generate environmental impacts.

Proposed environmental management plan for the Clarion-Clipperton zone

Just a reminder that again this section provides information on a zone which has nothing to do with OSPAR, but which interest rely on the topic of an environmental management plan of the most active zone regarding mineral resources exploration. This plan still needs to be approved.

As this draft management plan covers to a large extent in what consists the mining activity and the impacts generated, and also provides interesting environmental management practices, we will detail it quite widely as a good case study to understand ISA's role.

Guiding principles

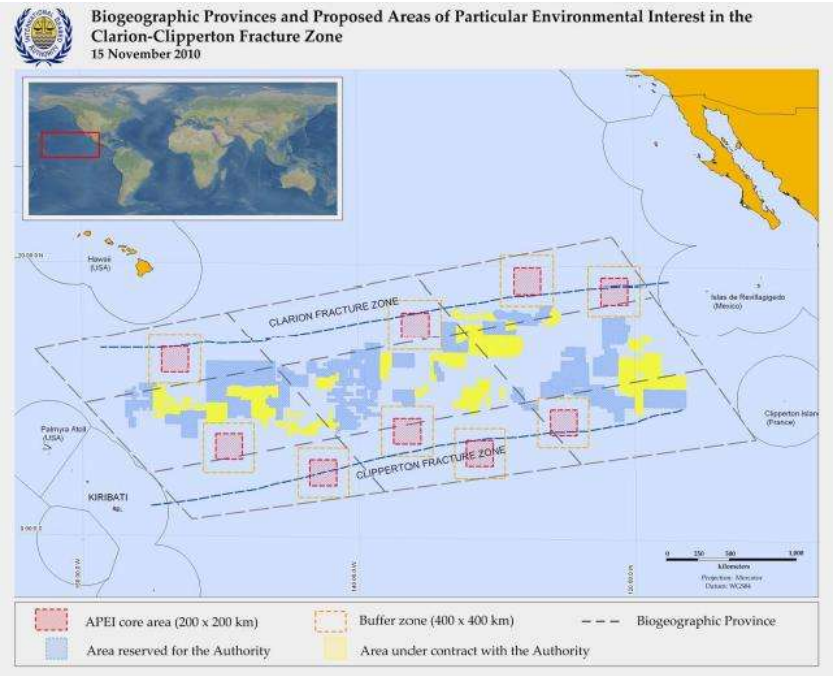
This plan is underpinned by the following guiding principles :

- Common heritage of mankind,
- Precautionary approach,
- Protection and preservation of the marine environment,
- Prior environmental impact assessment,
- Conservation and sustainable use of biodiversity,
- Transparency.

The areas of particular environmental interest

Apart from the contracts areas and the reserved areas, the plan defines a set of zones of protection, that should not be affected directly or indirectly by physical activities or mining effects : the **areas of particular environmental interest** (APEIs). The design of these areas is based on the assumption that they would better represent the range of habitats and biodiversity if they occur in each of the nine Biogeographic Provinces of the zone. These Provinces are defined by cross sections of three east-west and three north-south strata of the whole area.

These areas of particular environmental interest are presented below (Figure 5). The east-west coverage is homogenous, but the north-south one seems to have suffered from the presence of contracts and reserved areas, as very little surface covers the central part.



Based on environmental considerations, such as the maintenance of minimum viable size of populations or the variability of habitats, the size of these areas has been set at 200 km*200 km. A buffer of 100 km has been added all around the 200 km core area, to avoid the effects of mining plumes in adjacent areas, so that the total size of each full APEI is 400 km*400 km.

Figure 5 : areas of particular environmental interest in the Clarion-Clipperton zone

Objectives and strategies of the environmental management plan

The environmental management plan is guided by a set of strategies and a number of specific or general objectives, which can be as well targeted to sub-areas as to the whole Clarion-Clipperton Zone.

	Entire Clarion-Clipperton Zone	Contract areas (addressed to contractors)	Areas of particular environmental interest
Goals	Facilitate exploitation of seabed resources in an environmentally responsible manner.		
	Follow the principles of Plan of Implementation of the 2002 World Summit on Sustainable development.		
	Maintain the regional biodiversity.		
	Use ecosystem-based management.		
	Preservation of representative and unique ecosystems.		
	Improve knowledge and facilitate cooperative research.		
	Monitor the environment.		
	Facilitate the involvement of developing countries and multilateral exchange.		
	Avoid overlap between contractor areas, reserved areas and areas of particular environmental interest.		
Strategic aims	Ensure environmentally responsible seabed mining.		
	Use international adopted conservation management tools.		
	Manage sustainably the area.		
	Maintain regional biodiversity and ecosystem structure and function.		
	Protect and conserve the natural resources.		
Operational objectives	Establish environmentally baseline data, periodically updated.	Application of best available environmental practices.	Protect biodiversity and ecosystems of mining activities.
	Undertake cumulative environ-mental impacts assessments.	Enhance data collection and dissemination.	Include a wide range of habitats of the entire zone.
	Weigh the environmental risks of technologies development.	Draw guidelines for impact and reference areas.	Avoid the potential overlap by contractors or reserved areas
		Plan management for recovery of habitats and faunal communities.	Make intelligible the locations for present or potential contractors.

Management objectives	Collate information from environmental impact assessments.	Development of site specific management plan by contractors.	Review data, assumptions, delineations and scientific approach
	Consider cumulative impacts of mining and other human activities.	Provide environmental data to the Secretariat.	Encourage adoption of compatible measures between organisations
	Exchange information on technologies (current or new).	Indicate the preservation and impacts reference zones.	Support research initiatives.
		Minimize impacts on preservation reference zones.	Develop monitoring mechanisms.
		Collaboration between contractors.	
		Maximize the recovery of biota.	

Implementation	The present management plan should be implemented by the Secretariat, as directed by the LTC.
	Additional resources needed should be detailed in a proposal developed by the Secretariat

Review	The present management plan will be reviewed by the Legal and Technical Commission every 2 to 5 years, and updated at least 2 years before 2016.

Priority actions	The secretariat will set up a working group to facilitate the establishment of the environmental database.
	When gathered, review of the data to assess biogeography of the zone.
	The Authority will publish periodically (5 to 10 years) an environmental quality status report of the zone.
	The Secretariat will complete a cumulative impact assessment.
	Organisation at least one year before 2016, by the Secretariat of a workshop to develop guidelines for the establishment of impacts and preservation zones by contractors.

Figure 6 : objectives and strategies of the environmental management plan

Knowledge

The Authority also has the responsibility to promote and encourage marine scientific research in the international seabed area and to disseminate the results of such research (ISA's website).

ISA has developed several activities to further and spread the knowledge both on mineral resources and on techniques for its extraction (including their potential impacts). As main initiatives we can list :

- The organisation of an annual thematic workshop (the 2011 one was on environmental management needs for exploration and exploitation of deep seabed minerals),
- The management of a Central Data Repository (link here),
- A GIS interactive mapping resource interface (link here),
- The development and maintenance of an ISA Library Catalogue (link here) and an ISA Bibliographic Database (link here).

Lessons learned for the management of OSPAR HSMPAs

Mining activity in the OSPAR part of the Area

Once again, we remind that no contract has been signed by ISA for mining activity in the OSPAR part of the Area and that in terms of mineral resources this zone is far to be part of the wealthiest in the world.

Environmental management tools

The environmental management plan as a whole could be a source of inspiration due to its consistence and exhaustiveness, but some particular points attracts the attention too.

The selection of areas of particular environmental interest by strata is especially designed to encompass the full range of habitats and biodiversity so this approach deserves to pay particular attention to as it directly targets representativeness. It also makes sense in terms of networking, as the areas have limited remoteness between each others.

Buffer zone is also a relevant tool and seems replicable in several activities, the buffer extent depending on the nature of the activity. For example if it would be quite insignificant for fishing activities but it would be considerable for shipping-born pollutions.

On the other hand the design of the APEIs suffers a little from the fact that the contracts and reserved areas have preceded them. Maybe for other areas of mining activities in the future, the best option in terms of environmental management should be to anticipate the creation of a plan, as soon as an application is submitted.

Besides, with good reason, the environmental management plan seems to target an integrated approach by encouraging the collaboration with other competent intergovernmental organisations. However in the Clarion-Clipperton zone, this objective is weakened by the lack of Regional Sea Convention and Regional Fisheries Management Organisation (except the Inter-American Tropical Tuna Commission, only for tunas).

The Regulations on prospecting and exploration also promotes good practices such as :

- The establishment of environmental baselines, before mining activity ;
- The obligation for potential future applicant for exploitation contract, to propose areas to be set aside and used exclusively as impact reference zones and preservation reference zones ;
- A reporting scheme to draw emergency orders in case of occurrence of unexpected harms to the marine environment.

Potential conflicts

As far as the current knowledge is and as the maps of mineral resources shows (for example Figure 4), a lot of the known mineral resources are in the "shallow depths" areas, i.e. ridges or seamounts (and continental shelves). This applies in general and in particular in the Northeast Atlantic, where all these "shallow depths" areas are candidates EBSAs.

So regarding the seabed in ABNJ covered by the maritime area of the OSPAR Convention, if any mining activity occurs in the future, it is very likely to be in a potential EBSAs (proposed for CBD 2012), and probably in an OSPAR HSMPA.

Conclusion

As this document stresses, ISA has already developed framework and tools to surround mining activities in a sustainable way and with the constant objective of minimising environmental impacts.

To date no mining activity occurs in the OSPAR part of the Area and it is not the part of the world where potential future mining activities are likely to arise first. Anyway, if such activities emerge in the seabed in ABNJ covered by the maritime area of the OSPAR Convention, it is good to bear in mind that it will very likely overlay areas of ecological or biological interest.

Therefore any application for mining activity in the OSPAR part of the Area should be the immediate start in OSPAR of a thinking process about the possibility to adapt and implement the ISA's tools for environmental management of the area, in order to anticipate as much as possible by taking advantage of the time offered by the waiting period for approval of an application.