CURRENT STATUS OF THE RESERVED AREAS WITH THE INTERNATIONAL SEABED AUTHORITY

1. Reserved Areas

The mechanism of so-called 'reserved areas' is a key component of the system of access to the international seabed area (the 'Area') and its mineral resources under the United Nations Convention on the Law of the Sea (UNCLOS) and the 1994 Agreement relating to the Implementation of Part XI UNCLOS (1994 Agreement). It is one of the means by which UNCLOS ensures that developing countries can access deep-sea mineral resources.

Reserved areas are contributed by developed States when they apply to the International Seabed Authority (ISA) for mineral resources exploration rights in the Area. They are then held in a 'site bank' which is reserved for access by the Enterprise or by developing countries (UNCLOS, Article 170, Annex IV and 1994 Agreement, Annex, Section 2). One of the responsibilities given to the Secretariat is to carry out resource assessments of the reserved areas.

This briefing paper outlines the status of the remaining reserved areas held by ISA and the results of efforts by the Secretariat to evaluate the resources contained in those reserved areas.

2. How does the system work?

Under the mechanism of reserved areas, every application for exploration for polymetallic nodules (PMN) made by a developed State must cover a total area sufficiently large, but not exceeding 150,000 km^2, and of enough estimated commercial value to allow two mining operations. The areas proposed do not need to be a single contiguous area. The applicant is required to divide the total area into two parts of equal estimated commercial value and provide survey data and information to substantiate the estimated values.

In the case of polymetallic sulphides (PMS)[1] and cobalt-rich crusts (CRC)[2] a different system applies. In view of the difficulty encountered by applicants in collecting sufficient survey data to identify two sites of equal estimated commercial value, the ISA Council decided to give applicants the option to either contribute a reserved area, or to offer a future equity interest in a joint venture with the Enterprise. So far, all applicants for exploration for PMS have chosen the latter option and therefore there are no reserved areas. In the case of CRC, only one out of four contractors, the Ministry of Natural Resources and Environment (MNRE) of the Russian Federation, took the option to contribute to a reserved area.

The ISA Legal and Technical Commission, the subsidiary body of the Council made of independent experts, then evaluates the application and reviews the data and information provided by the applicant

[1] For a polymetallic sulphides' exploration application, the total area must not be exceeded 100 (100 km^2/block) blocks. If the applicant has elected to contribute a reserved area to carry out activities, the total area must not exceed 200 blocks to allow to designate the 50% as a reserved area The total area must not exceed 150 blocks (20 km^2/block), or 300 blocks if the applicant has elected to contribute a reserved area to carry out activities.

[2] For a cobalt-rich ferromanganese crusts' exploration application, the total area must not exceed 150 blocks. If the applicant has elected to contribute a reserved area to carry out activities, the total area must not exceed 300 blocks to allow to designate the 50% as a reserved area.

to verify that the two areas are of equal estimated commercial value. Based on its findings, the Commission makes a recommendation to the ISA Council on which area should be allocated to the applicant, and which area should be kept as a reserved area.

3. Background

The first reserved areas were contributed in the late 1980s and early 1990s, before UNCLOS came into force, under the so-called pioneer investor regime (Resolution II of the Final Act of the Third UN Conference on the Law of the Sea).

Table 1. Registered Pioneer Investors and contractors that have contributed to the reserved areas

		Region	Entity/Contractor	Country/Sponsoring States	Year
PMN	Former Registered Pioneer Investors	Indian Ocean	Department of Ocean Development later MOES)	India	2002
		Clarion-Clipperton Zone (CCZ)	Deep Ocean Resources Development Co. Ltd. (DORD)	Japan	2001
			Yuzhmorgeologiya	USSR (later Russian Federation)	2001
			IFREMER/AFERNOD (later IFREMER)	France	2001
			Interoceanmetal Joint Organization (IOM)	Composed of Bulgaria, Cuba, Czechia, Russian Federation, Slovakia and Poland	2001
			China Ocean Mineral Resources Research and Development Association (COMRA)	China	2001
			The Government of the Republic of Korea (currently Korea Institute of Ocean Science and Technology)	Republic of Korea	2001
	Contractors		The Federal Institute for Geosciences and Natural Resources (BGR)	Germany	2006
			Global Sea Mineral Resources NV (GSR)	Belgium	2013
			UK Seabed Resources Ltd.- I (UKSRL-I, later Loke CCZ-I)	United Kingdom	2013
			UK Seabed Resources Ltd. - II (UKSRL-II, later Loke CCZ-II)	United Kingdom	2016

		Region	Entity/Contractor	Country/Sponsoring States	Year
		Northwest Pacific	Beijing Pioneer Hi-Tech Development Corporation (BPHDC)	China	2019
CFC	Contractors	Northwest Pacific	Ministry of Natural Resources and Environment (MNRE)	Russian Federation	2015

Of the seven registered pioneer investors (RPIs) (see Table 1), the Department of Ocean Development (DOD) contributed one reserved area in the Central Indian Ocean Basin (CIOB) and the remaining six RPIs contributed each a reserved area in the Clarion Clipperton Zone (CCZ). Data provided by RPIs included geographic coordinates of areas, turning points and sampling positions, sampling data, and bathymetric maps. These data were transferred into the ISA DeepData database.

The sampling data in the reserved areas included 2,785 sampling stations and 2,004 stations where the occurrence of nodules was investigated. Station data comprised coordinates (longitude and latitude), an abundance measurement in kg/m, and metal content in nodules of manganese, nickel, copper and cobalt in percentage. The depths in the reserved areas varied between 4,300 to 5,300 m.

Since the establishment of ISA in 1994, additional reserved areas have been contributed as new exploration contracts for polymetallic nodules (PMN) have been issued. In 2006, a reserved area was contributed by the Federal Institute for Geosciences and Natural Resources (BGR) of Germany. Global Sea Mineral Resources NV (GSR, Belgium) and UK Seabed Resources Ltd. (UKSRL, now Loke CCZ) of the United Kingdom contributed reserved areas in 2013 and in 2016. The contractor Beijing Pioneer Hi-Tech Development Corporation (BPHDC, China), after assessing the resource potential of its total contract area in the Northwest Pacific, has contributed to the reserved areas for polymetallic nodules in 2019.

In total, 1,165,633 km^2 has been contributed to PMN reserved areas in the CCZ, which includes 887,768 km^2 contributed by RPIs, and 150,000 km^2 in the CIOB. An additional 3,000 km^2 for CFC has been contributed in the Northwest Pacific by MNRE in 2015 (See table 2).

As of May 2024, 839,218 km^2 for PMN and 3,000 km^2 for CFC are available in the ISA reserved area site bank.

Table 2. Reserved areas available with the International Seabed Authority (as of March 13, 2024)

	Contractors	Original reserved areas (km²)	Remaining reserved areas (km²)	Final area allocated to contractors (km²)
PMN	DOD (later MOES)	150,000	150,000	75,000
	Deep Ocean Resources Development Co. Ltd. (DORD)	150,000	123,901	75,000
	Yuzhmorgeologiya	132,328	87,531	75,000
	IFREMER/AFERNOD (later IFREMER)	155,440	139,677	75,000
	Interoceanmetal Joint Organization (IOM)	150,000	93,898	75,000
	China Ocean Mineral Resources Research and Development Association (COMRA)	150,000	118,518	75,000
	The Government of the Republic of Korea (currently Korea Institute of Ocean Science and Technology)	150,000	68,008	75,000
	The Federal Institute for Geosciences and Natural Resources (BGR)	72,744	31,766	74,724
	Global Sea Mineral Resources NV (GSR)	71,937	0	57,720
	UK Seabed Resources Ltd.- I (UKSRL-I)	58,280	0	57,720
	UK Seabed Resources Ltd.- II (UKSRL-II)	74,904	74,904	74,919
	Beijing Pioneer Hi-Tech Development Corporation (BPHDC)	74,916	74,916	74,052
	Sub-Total:	**1,390,549**	**963,119**	**864,135**
CFC	Ministry of Natural Resources and Environment (MNRE)	3,000	3,000	2,000 (after the 1st relinquishment from the original 3,000 [as of May 14, 2024]))
	Sub-Total:	**3,000**	**3,000**	**2,000**

Figure 1. Former and current reserved areas for polymetallic nodules in the CCZ.

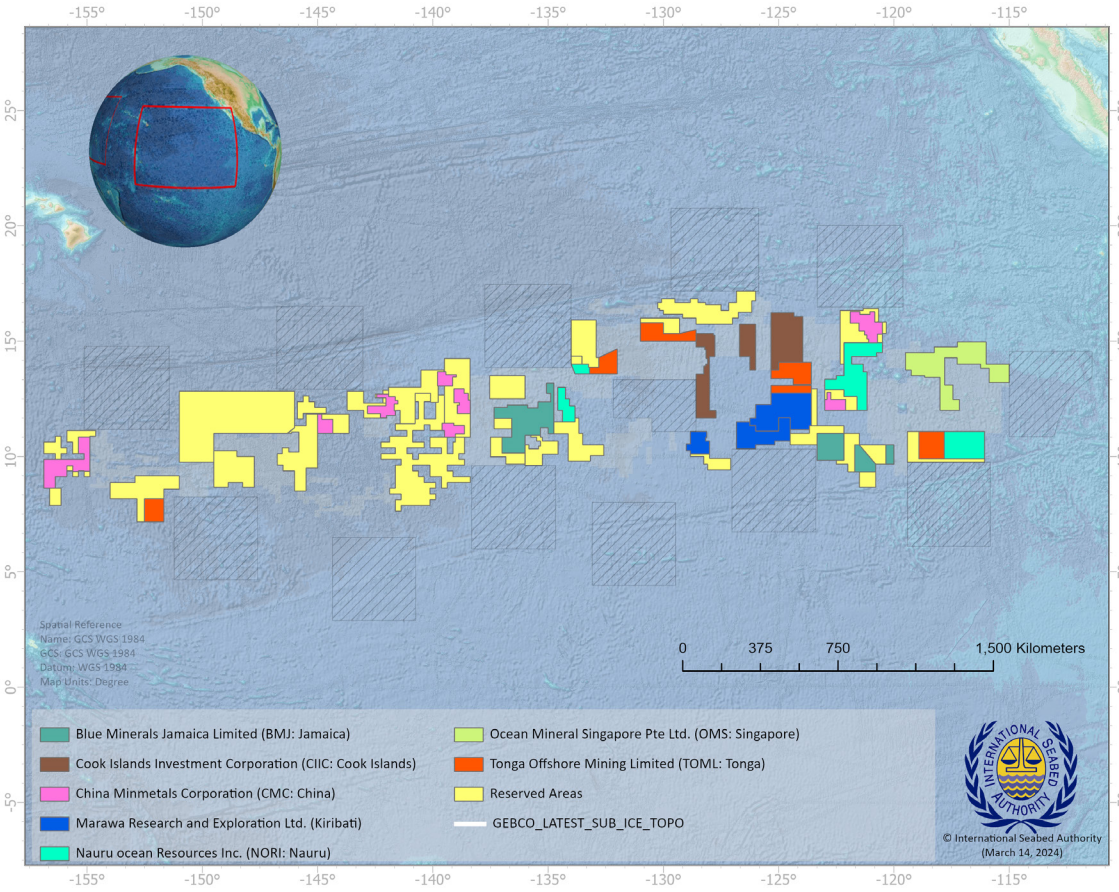


Figure 2. Reserved area for polymetallic nodules in the Indian Ocean.

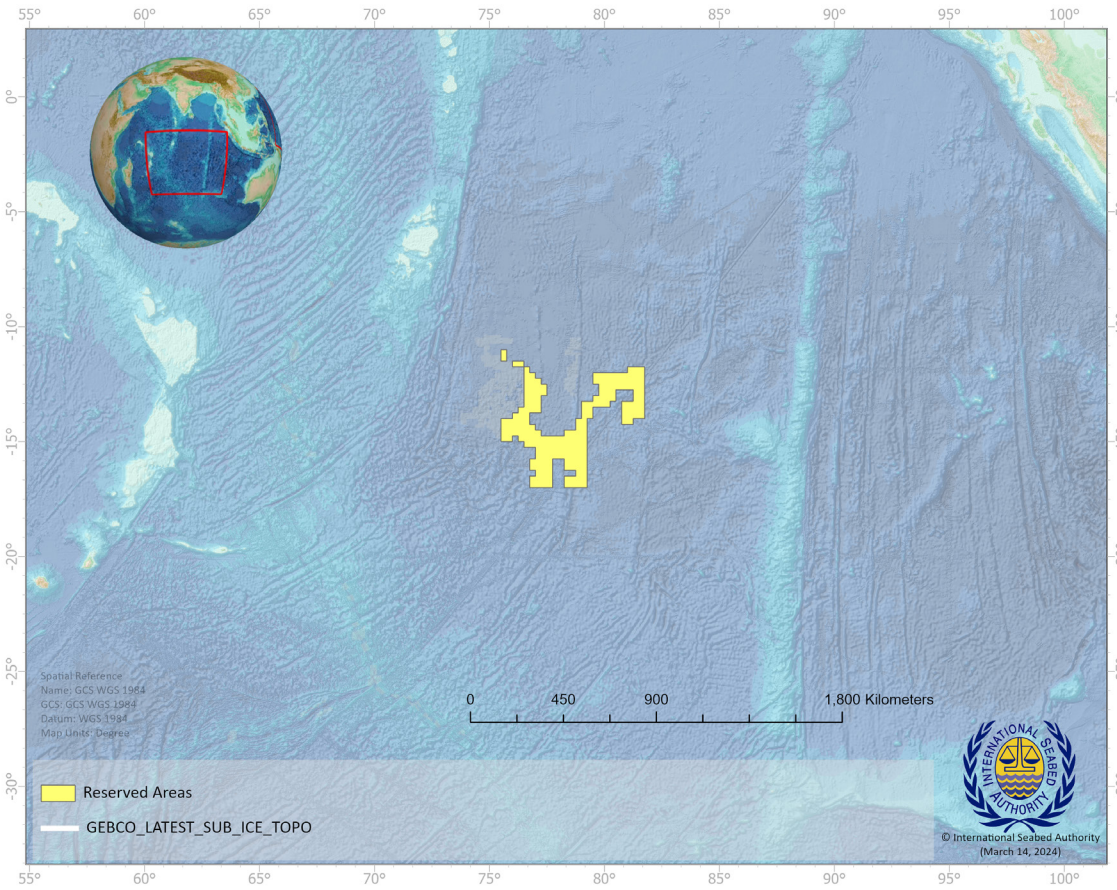
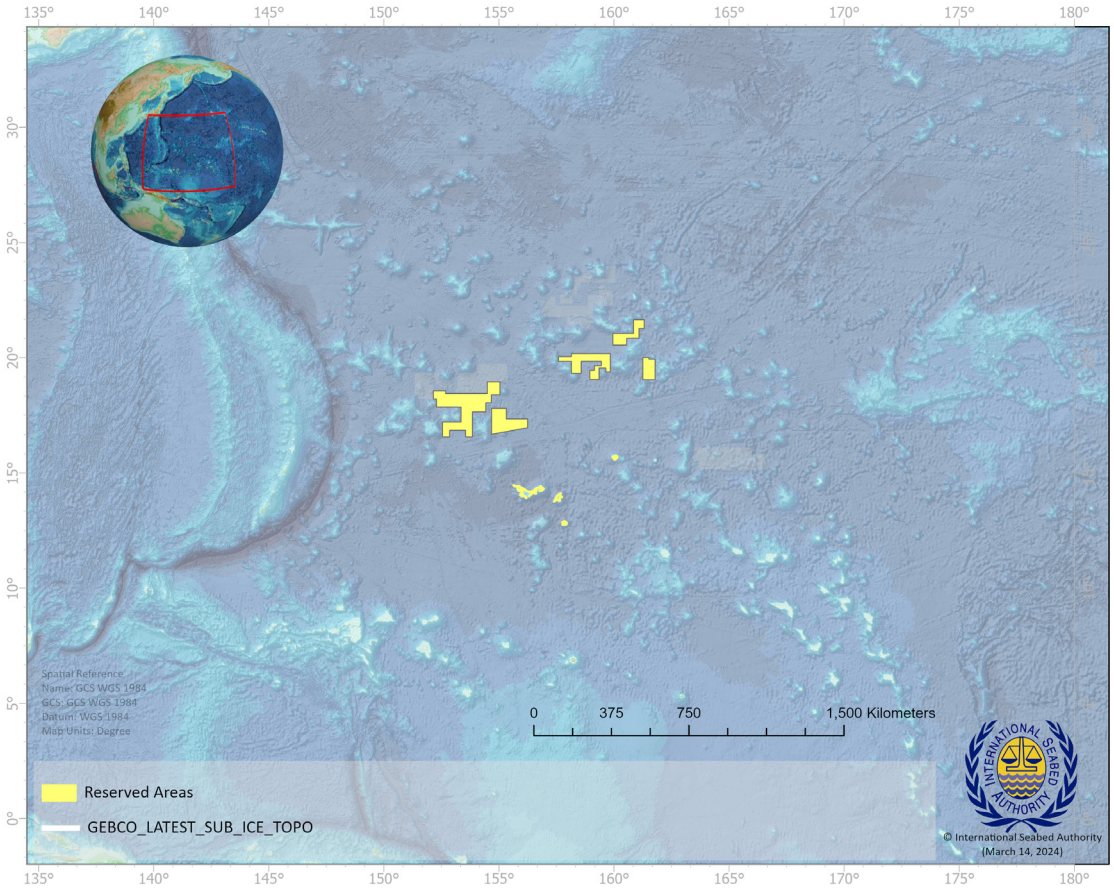


Figure 3. Reserved areas for polymetallic nodules and cobalt-rich ferromanganese crusts in the Northwest Pacific Ocean.



4. Use of Reserved Areas

Several developing countries have taken advantage of the provisions in UNCLOS to sponsor exploration activities in the reserved areas. In 2011, Nauru Ocean Resources Inc (NORI) was granted an exploration contract over four sub-areas taken from the reserved areas contributed by BGR (Germany), Yuzhmorgeologiya (Russian Federation) and Interoceanmetal Joint Organization (IOM, Bulgaria, Cuba, Czechia, Poland, Russian Federation and Slovakia). In the same year, Tonga Offshore Minerals Ltd (TOML, Tonga) was given an exploration contract over six sub-areas from the reserved areas contributed by BGR (Germany), Deep Ocean Resources Development Co Ltd. (DORD, Japan), the Government of the Republic of Korea, and Institut français de recherche pour l'exploitation de la mer (IFREMER, France). In 2012, Marawa Research and Development (Marawa, Kiribati) signed an exploration contract with ISA covering three regions in three blocks contributed by the Government of Korea.

In 2015, Ocean Mineral Singapore Pte Ltd (OMS) was awarded exploration rights with ISA covering a block contributed by Loke CCZ I.

The exploration contract signed by Cook Islands Investment Corporation (CIIC) in 2016 covers three non-contiguous subparts, which are adjacent to the exploration contract area allocated to GSR and contributed by the same contractor.

In the case of China Minmetals Corporation (CMC, China), which signed an exploration contract with ISA in 2017, the application area was divided into eight blocks, selected from five different reserved areas contributed by Yuzhmorgeologiya,

IOM and China Ocean Mineral Resources Research and Development Association (COMRA, China).

Finally, Blue Minerals Jamaica (BMJ) signed an exploration contract in 2021 covering reserved areas contributed by IOM, Government of Korea, Loke CCZ-II.

The total dimension of the reserved areas that have been allocated to developing countries is 502,411km^2 (see Table 3 below).

Table 3. Reserved areas allocated to developing countries

Contractor	Sponsoring State	Reserved areas allocated (km^2)
Tonga Offshore Mining Limited (TOML)	Tonga	74,713
Nauru Ocean Resources Inc. (NORI)	Nauru	74,830
Marawa Research and Exploration Ltd.	Kiribati	74,990
Ocean Mineral Singapore PTE Ltd. (OMS)	Singapore	58,280
Cook Islands Investment Corporation (CIIC)	Cook Islands	71,937
China Minmetals Corporation (CMC)	China	72,745
Blue Mineral Jamaica (BMJ)	Jamaica	74,916
	Total:	**502,411**

5. Resource assessment

Resource assessment ISA carried out an initial resource assessment of the reserved areas in three steps: (i) analysis of the data and information contained in the ISA database (ii) validation and adjustment of the data and information that it contained (iii) and geostatistical analysis and estimate of the metals contained in deposits in reserved areas. One problem encountered by the Secretariat was that different techniques had been used in collecting samples and photographing the sea bottom to determine nodule abundance. In some areas, samples were taken 10-15 km apart, and in other blocks the sampling distance was up to 100 km, yielding poor-coverage data. The procedures for chemical analysis of samples also differed between pioneer investors and later contractors, each having its own protocol and procedure.

Furthermore, some of the pioneer investors used conventional echo sounders, while others used multibeam echo sounders, resulting in significant differences in maps. In 2001, the Secretariat commissioned Geostat Systems International (GSI) of Canada to carry out resource estimation for the reserved areas. For this purpose, the reserved areas were divided into 12 sectors, each one contained one to four blocks (total 24 blocks), delimited by boundaries in the form of polygons, covering one block in the CIOB (Figure 2) and 23 blocks of seabed in the CCZ (Figure 3). The study by GSI concluded that on the basis of the data submitted by contract applicants between 1987 and 1994, some 5,400 million tons of metal

lay on the seabed in the reserved areas, though the reserved areas could not be considered as a single mineral deposit due to their size. It was also not realistic to classify the resources of the reserved areas as measured, indicated or inferred, since sampling is so far apart that it is beyond reasonable mining scales.

In 2018, ISA carried out an exercise to assess available resources in the remaining reserved areas for PMN. The data for remaining reserved areas for seven RPIs were extracted from ISA's database. Data submitted from subsequent contractors in the CCZ were added to the present data sets. The resource data included also nodule abundance (kg/m2), contained manganese, nickel, cobalt, copper (%) and water depths (m). Quality checks were undertaken to ensure consistency of the data as well as on the spatial accuracy. By combining mineral grade percentage and weight of nodule per kilometre area (abundance), the quantity of metal contained in nodules per unit surface area could be calculated. The grades of nodules are expressed in dry weight while abundance is expressed in wet weight per unit of surface area. The reduction factor used to arrive at the former is 0.7. By multiplying the quantity of metal by a given area, the tonnage of in situ metal or recoverable metal equivalent in the area can be calculated.

Though some of the blocks in the reserved areas have better sampling, the overall data are not adequate from the perspective of resource classification. Rather, the resource model represents an inventory of the seabed nodules that may become economically extractable in the future and could be used to delineate areas that offer greater potential and to characterize areas of best economic potential.

Further Reading

i. Consolidated text of the Convention and the 1994 Agreement see "The Law of the Sea –Compendium of Basic Documents" International Seabed Authority/The Caribbean Publishing Company, Kingston, Jamaica, 2001, pp. 48- 92 and Annex III pp.142-159

ii. Consolidated Regulations and Recommendations on Prospecting and Exploration, International Seabed Authority, 2015 [also see: https://www.isa. org.jm/mining-code]

iii. Status of exploration for mineral resources in the Area, 2024

iv. Kaiser de Souza (2009), Resource Assessment of the metals in polymetallic nodule deposits in the Area, Geology of the C-C Zone: existing geological information in respect of PMN; p.111, In Proceedings of the ISA Workshop held 13-20 May, 2003 in Nadi, Fiji.

v. Robert de L'Etoile (2009), A Resource Model for the seabed polymetallic nodules in the Reserved Areas, Geology of the C-C Zone: existing geological information in respect of PMN; In Proceedings of the ISA Workshop held 13-20 May, 2003 in Nadi, Fiji.