



Current Status of the Reserved Areas with the International Seabed Authority

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). 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 exploration rights. They are then held in a 'site bank' which is reserved for access by developing countries or for the Enterprise (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.

How does the system work?

Every application for exploration made by a developed State must cover a total area sufficiently large and of enough estimated commercial value to allow two mining operations. The areas proposed do not need to be a single contiguous area. Nevertheless, 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.

The ISA Legal and Technical Commission will then evaluate the application and review

the data and information provided by the applicant to verify that the two areas are of equal estimated commercial value. Based on its findings, the Commission will make 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.

Background

The first reserved areas were contributed before UNCLOS came into force during the late 1980s and early 1990s, 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

Entity	Country
DOD (later MOES)	India
Yuzhmorgeologiya	USSR (later Russian Federation)
DORD	Japan
IFREMER/AFERNOD (later IFREMER)	France
Interoceanmetal Joint Organization (IOM)	Composed of Bulgaria, Cuba, Czech Republic, Russian Federation, Slovakia Republic and Poland
COMRA	People's Republic of China
The Government of the Republic of Korea (currently Korea Institute of Ocean Science and Technology)	Republic of Korea

Of the seven registered pioneer investors (RPIs) (see Table 1), DOD contributed one reserved area in the Central Indian Ocean Basin (CIOB) and the remaining six RPIs each contributed 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 ISA's 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 5,300m.

Since the establishment of ISA in 1994, additional reserved areas have been added as new exploration contracts for polymetallic nodules (PMN) have been issued. In 2005, a reserved area was contributed by the Federal Institute for Geosciences and Natural Resources (BGR) of the Federal Republic of Germany. Global Sea Mineral Resources NV (GSR) of Belgium and UK Seabed Resources Ltd. (UKSRL) of the United Kingdom contributed reserved areas in 2012 and UKSRL contributed a second reserved area in 2014.

In the case of polymetallic sulphides (PMS) and cobalt-rich crusts (CRC) 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 there are no reserved areas. In the case of CRC, only one out of five contractors – the Russian Federation – took the option to contribute a reserved area.

In total, 1,165,633 sq. km has been contributed to PMN reserved areas in the CCZ and

150,000 sq. km in the CIOB (See figures 1-2). An additional 3,000 sq. km (for cobalt-rich crusts) has been contributed in the Western Pacific. Of these totals, 887,768 sq. km in the CCZ was contributed by the former registered pioneer investors. As of January 2019, a total of 888,218 sq. km area remains available in the reserved area site bank for PMN and 3000 sq. km for CRC.

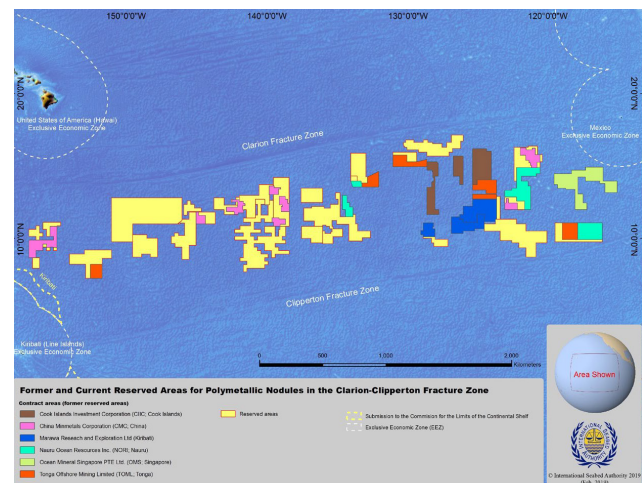


Figure 1: Former and current reserved areas for polymetallic nodules in the CCZ

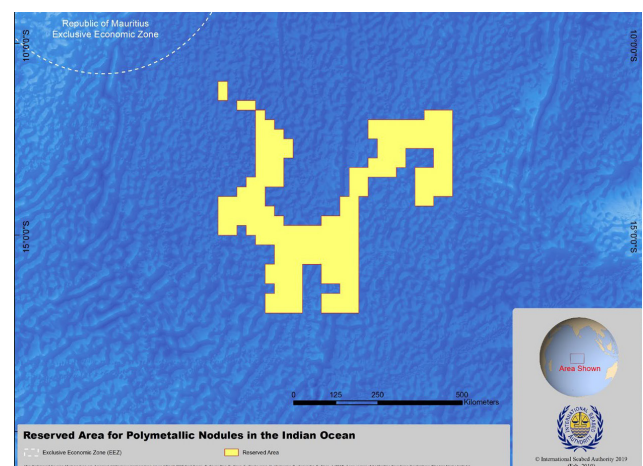


Figure 2: Reserved area for polymetallic nodules in the Indian Ocean

Use of the 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 given an exploration contract over four sub-areas taken from the reserved areas contributed by BGR (Germany), Yuzhmorgeologiya (Russian Federation) and IOM (Bulgaria, Cuba, Czechia, Poland, Russian Federation and Slovakia). In the same

**Table 2: Reserved areas available with the International Seabed Authority
(as of January 2019)**

Polymetallic nodules contractors	Original reserved areas (sq. km)	Remaining reserved areas (sq. km) (as of 2019)	Final area allocated to contractors (sq. km)
Government of India - MOES	150,000	150,000	75,000
Deep Ocean Resources Development Co. Ltd. (DORD) (Japan)	150,000	123,901	75,000
Institut français de recherche pour l'exploitation de la mer (IFREMER) (France)	155,440	139,677	75,000
Yuzhmorgeologiya (Russian Federation)	132,328	87,531	75,000
China Ocean Mineral Resources Research and Development Association (COMRA) (China)	150,000	118,518	75,000
Interoceanmetal Joint Organization (IOM) (Bulgaria, Cuba, Czechia, Poland, Russian Federation and Slovakia)	150,000	93,898	75,000
Government of the Republic of Korea	150,000	68,008	75,000
Federal Institute for Geosciences and Natural Resources of the Federal Republic of Germany (BGR)	72,744	31,766	77,230
UK Seabed Resources Ltd I (United Kingdom)	58,280	0	57,720
Global Sea Mineral Resources NV (GSR) (Belgium)	71,937	0	76,728
UK Seabed Resources Ltd II (United Kingdom)	74,904	74,904	74,919
Total	1,315,633	888, 218	811,597

Table 3: Reserved areas allocated to developing countries

Contractor	Sponsoring State	Reserved areas allocated (sq. km)
Tonga Offshore Mining Limited	Tonga	74,713
Nauru Ocean Resources Inc.	Nauru	74,830
Marawa Research and Exploration Ltd.	Kiribati	74,990
Ocean Mineral Singapore PTE Ltd.	Singapore	58,280
Cook Islands Investment Corporation	Cook Islands	71,937
China Minmetals Corporation	People's Republic of China	72,745
Total	888, 218	427,495

year, Tonga Offshore Minerals Ltd (TOML) was given an exploration contract over six sub-areas from the reserved areas contributed by BGR (Germany), Deep Ocean Resources Development Co Ltd. (DORD), of Japan, the Government of the Republic of Korea (ROK), and IFREMER (France). In 2012, Marawa Research and Development (sponsored by Kiribati) received a contract covering three regions in three blocks contributed by ROK (See Figure 1).

In the case of China Minmetals Corporation, which signed an exploration contract 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) of People's Republic of China. On the other hand, the exploration contract signed by Cook Islands Investment Corporation covers three non-contiguous subparts, which are adjacent to the subparts of the area under exploration allocated to GSR and contributed by the same contractor.

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 multi-beam 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.

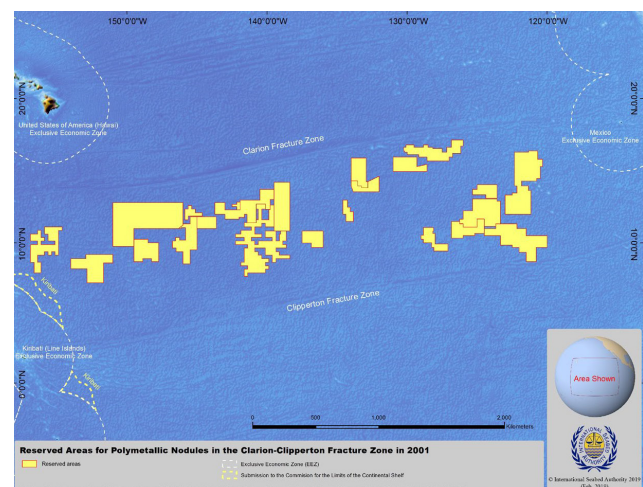


Figure 3: Reserved areas for polymetallic nodules in the CCZ (2001)

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. 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.
- iv. 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.
- v. Delineation of Mine-Sites and Potential in Different Sea Areas. Seabed Minerals Series, p.28, v.4, United Nations, 1987



ABOUT THE INTERNATIONAL SEABED AUTHORITY

Made up of 167 Member States, and the European Union, ISA is mandated under the UN Convention on the Law of the Sea to organize, regulate and control all mineral-related activities in the international seabed area for the benefit of mankind as a whole. In so doing, ISA has the duty to ensure the effective protection of the marine environment from harmful effects that may arise from deep-seabed related activities.