Deep Seabed Mining: It is about to begin?
Nickel
Copper
Cobalt
Manganese
Gold
Silver
Zinc
REEs (neodymium, dysprosium, etc.)
500 kg of Ni
1 000 kg of Cu
12 times more Cu to produce 1 Kw than conventional power
Stable legal regime

Industry

Profitability
The International Seabed Authority created to manage mineral resources of the deep seabed as the common heritage of mankind.
The International Seabed Authority created to manage mineral resources of the deep seabed as the common heritage of mankind

- Authorize (by contracts) deep seabed mining in the Area
- Protect the marine environment from mining impacts
- Distribute proceeds of mining for the benefit of the developing countries
- 165 members (near universal)
Current regulations cover prospecting and exploration phases for polymetallic nodules, polymetallic sulphides and cobalt-rich crusts.

Regulatory framework largely identical, differences reflect different nature of resources.
Polymetallic nodules
Polymetallic sulphides
Cobalt-rich crusts
Polymetallic Nodules Exploration Areas in the Clarion-Clipperton Fracture Zone
Areas under contract and areas reserved for the International Seabed Authority

Contract area or contract approved as of 28 February 2013

- Marawa Research and Exploration Ltd (Kiribati)
- Bundesanstalt für Geowissenschaften und Rohstoffe (BGR; Germany)
- China Ocean Mineral Resources Research and Development Association (COMRA; China)
- Deep Ocean Resources Development Company (DORD; Japan)
- G-TEC Minerals Resources NV (GSR; Belgium)
- Government of the Republic of Korea
- Institut français de recherche pour l'exploitation de la mer (IFREMER; France)
- Interoceanmetal (IOM; Bulgaria, Cuba, Czech Republic, Poland, Russian Fed., Slovakia)
- Nauru Ocean Resources Inc. (NORI; Nauru)
- Tonga Offshore Mining Ltd (TOML, Tonga)
- UK Seabed Resources Ltd (UKSRL, UK)
- Yuzhmorgeologiya (Russian Federation)

Reserved area*  Area of particular environmental interest (APEI)**  Exclusive Economic Zones (VLIZ, 2011)

* In the case of polymetallic nodules, the so-called parallel system provides that each application for exploration by a developed State must cover two parts of "equal estimated commercial value". One part is allocated to the applicant and the other is to become the reserved area, which is set aside for the conduct of activities by the Authority or developing States.

** In July 2012, the Authority adopted an environmental management plan for the Clarion-Clipperton Zone to be implemented on a provisional basis over an initial three-year period. The plan includes the designation of a network of areas of particular environmental interest (ISBA/18/C/22).
Polymetallic Sulphides Exploration Areas on the Mid-Atlantic Ridge
Areas under contract or approved by the International Seabed Authority

- Exploration block (approx. 10 x 10 km)
- Confinement area containing 100 polymetallic sulphides exploration blocks*
- EEZ Boundaries (VLIZ 2011)

* According to the Regulations on prospecting and exploration for polymetallic sulphides, a maximum of 100 exploration blocks (not exceeding 100 sq. km) must be arranged in clusters with at least five contiguous blocks. Clusters need not to be contiguous, but shall be confined within a rectangular area, where the longest side does not exceed 1,000 km.
Exploration contractors

2001 (former Registered Pioneer Investors)
IFREMER (France)
Government of India
Interoceanmetal Joint Organization (Eastern European)
Yuzhmorgeologiya (Russian Federation)
DORD (Japan)
COMRA (China)
Government of Korea

2006
BGR (Germany)
Exploration contractors

2011
Nauru Ocean Resources Inc. (Nauru)
Tonga Offshore Mining Ltd (Tonga)
COMRA (China) (Sulphides)
Russian Federation (Sulphides)

2012 - 2013
UK Seabed Resources Ltd (UK)
GTEC Sea Minerals NV (Belgium)
Government of Korea (Sulphides)
IFREMER (France) (Sulphides)
Marawa (Kiribati)
JOGMEC (Japan)
COMRA (China) (Crusts)
Exploration contractors

**2011**
Nauru Ocean Resources Inc. (Nauru)
Tonga Offshore Mining Ltd (Tonga)
COMRA (China) (Sulphides)
Russian Federation (Sulphides)

**2012 - 2013**
UK Seabed Resources Ltd (UK)
GTEC Sea Minerals NV (Belgium)
Government of Korea (Sulphides)
IFREMER (France) (Sulphides)
Marawa (Kiribati)
JOGMEC (Japan)
COMRA (China) (Crusts)

**2001-2006**
IFREMER (France)
Government of India
Interoceanmetal Joint Organization
Yuzhmorgeologiya (Russia)
DORD (Japan)
COMRA (China)
Government of Korea
BGR (Germany)
Prospects for seabed mining

Supply
Demand
Technology
Profitability
Global consumption of Ni, Cu, Co and Mn, 2004-2008

Net imports of Ni, Cu, Co and Mn, 2004-2008

$ = USD millions
% = approximate global percentage
Mining sensitivity to economic factors

Most sensitive:
- Metal Price
- Metal Content
- Fiscal Regime
- Processing Cost
- Mining Cost

Least sensitive:
- Energy/fuel Cost
- Transportation Cost