

The need of Marine Protected Areas in High Seas

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The concern of International Community for conservation and sustainable use of marine biodiversity in ABNJ (Areas Beyond National Jurisdiction) is increasing because of increasing threats (overexploitation of biological resources, destructive fishing practices, pollution, wastes disposal, acidification, deep sea drilling and mining, geo-engineering activities, cables, tourism, shipping), difficulties in reaching international agreements on governance and protection. More than 30 years after the adoption of UNCLOS (United Nations Convention on the Law of the Sea, 1982) raised the doubt that the ambitious proposals on conservation of living resources, protection and preservation of the marine environment have been reached, in particular those dealing with the governance of marine biodiversity in ABNJ. Unfortunately no general consensus exists. A large number of States recognize the need of a new agreement while others consider sufficient to improve existing rules to conserve sustainable exploitation of marine biodiversity in the ABNJ.

According to UNCLOS the ABNJ encompass the high seas and the Area which is defined in article 1 (1) of UNCLOS: *“the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction”*. Following article 86 the high seas are *“all parts of the sea that are not included in the exclusive economic zone, in the territorial sea or in the archipelagic waters of an archipelagic state”*. The two parts together represent about 50% of the Earth and host an important percentage of its biodiversity. They include the water column and seabed beyond national jurisdiction, as well as some of the deepest most mountainous, and most thermally active zones of the ocean.

They are some of the least explored and poorly investigated areas of our planet as well as some of the most intensively exploited and heavily degraded environments. They need urgent measure of governance and protection.

Marine Protected Areas (MPAs) are one of the tools being used to restore, safeguard and stop negative impacts on the environment and the biodiversity of the oceans.

Seamount, deep sea coral reef and hydrothermal vent habitats have been proposed as priority for ABNJ MPAs.

Seamounts

Seamounts are underwater mountains which are generally cone shaped rising with steep slopes from the seabed but not emerging above the sea surface.

The water sweeping around the seamounts and exposed rocky substrate provide ideal conditions for suspension feeders as corals, gorgonians and others. Some species are typically restricted to seamount and characterized by high endemism.

The pelagic assemblages are qualitatively and quantitatively different from those of open sea. Many fishes also top predators are concentrate on and around the seamounts. The intense exploitation of fish, shellfish and corals have caused over exploitation and crashes in some stocks and reduction or destruction of benthic fauna.

Deep-water coral reef

Since more than a century the presence of corals in deep sea world-wide has been known and described also in relation to fishery. In cold deep water only six species are hard corals builders of reefs, the main are the white corals (*Lophelia pertusa* and *Madrepora oculata*), most of the species are soft corals.

Unlike tropical species white corals live at very deep down and therefore in the Mediterranean between 250 and 2500 metres, do not host symbiotic algae because of absence of light.

The coral reef provides of myriads microhabitats and a three dimensional structure that give shelter and substrate for settlement to many species endo- and epibiontic. More than 880 species have been recorded settled on *Lophelia* reefs in NE-Atlantic, while in the reef of Santa Maria di Leuca (Ionian sea) alone more than 220 living species occur.

Some are of commercial value and so are fished with damage on the reef. Trawl doors, wires and chains of demersal trawling are very dangerous to the coral reef that is a delicate structure and with slow growth rate. Fishermen let down bottom nets and longlines that can be entangled in the colonies's branches and break them.

In addition to fishing activity there is the exploration and production of oil in deep sea with physical damage and possible lethal and sub lethal effects of chemicals and contaminants used for drilling.

The corals are generally found in zones of strong current flow associated with topographic highs as for instance seamounts, ridges. These are true "hot spots" treasure of biodiversity, irreplaceable but at the same time extremely vulnerable biota at these depth.

Hydrothermal vent

The hydrothermal vent communities were discovered in 1977 during a series of dives in the Galapagos rift zone with the submersible Alvin. At about 2700 m depth a spectacular abundance of hitherto unknown organisms occurred in and around hot water geysers. The water temperature was 8-16 °C and with high content of hydrogen sulphide.

Similar communities were described in all areas of tectonic activity spreading centres, subduction zone, fracture in concentrated jets reaching temperatures of 400 °C. As the water emerge and cools the dissolved minerals precipitate out in black clouds forming large chimneys called "black smokers".

The geophysical and geochemical evidence suggests short burst hydrothermal activity occur lasting some decades or less. The animals are subject to large changes in their chemical environment.

All vent areas display an astonishing assemblages of large (megafauna) animals forming an unique association for the deep sea. They are “oases” in an otherwise low-density, low productivity area. The energy sustaining such lush oases came from primarily non-photosynthetic source of organic carbon. The chemoautotrophic bacteria using sulphur-containing inorganic components are key organism of the trophic system. The primary consumers are the various animals that filter out the bacteria from the water, graze the bacterial film from the substrate or are in symbiotic association with the bacteria. Productivity is very high, large biomass, high density, large size in many animals. The largest organism is the vestimentiferan worm *Riftia pachyptila* which can reach 3 m. Among the molluscs there are the giant clam *Calyptogena magnifica* which can attain 25 cm in length and the vent mussel *Bathymodiolus thermophilus* 18 cm. The polychaetes worms include the large “Pompei worm” *Alvinella pompejana* which can live on the sulphide chimneys walls of 350 °C black smokers. Research, tourism (because of use of submersibles) and in particular mining are the threats for this spectacular environment.

An International agreement for MPAs in ABNJ is urgent to halt the alarming loss of the ocean biodiversity.

The Pelagos International Sanctuary for Mediterranean Marine Mammals, in the Ligurian Sea, is the first regional agreed MPA with a high seas component. It encompasses an area of about 87 000 km² dealing with shallow and deep water benthic and pelagic habitats, including the territorial waters of France, Italy, Monaco and high seas.

For more information:

- [1] Druel E., Billé R. & Rochette J. (2013). *Getting to yes? Discussions towards an Implementing Agreement to UNCLOS on biodiversity in ABNJ*. Policy Brief N° 10/13. Iddri, Paris, France, 6 p.
- [2] Gage J.D. & Tyler P.A. (1991). *Deep-sea biology: a natural history of organisms at the deep-sea floor*. Cambridge University Press, 504 p.
- [3] Gjerde K.M. & Breide C. (2003). Towards a Strategy for High Seas Marine Protected Areas. *In: Proceedings of the IUCN, WCPA and WWF Experts Workshop on High Seas Marine Protected Areas*, 15-17 January 2003, Malaga, Spain. IUCN, Gland, Switzerland, 181 p.