Mining international seabed nodules

The Cook Islands and G-TEC Sea Mineral Resources (GSR), a private company of Belgium, have applied for an exploratory licence in the mineral-rich Clarion-Clipperton Zone (CCZ) nodule field in international waters.
The International Seabed Authority (ISA) requires developed nations that apply to explore the CCZ to partner with a developing nation such as the Cook Islands, with the developed nation shouldering the costs of the application and subsequent exploration but sharing any revenue received.
GSR approached the Cook Islands government recently, after the company signed a 15-year contract in January last year for prospecting and exploration of nodules in the area.
The Cook Islands then submitted its own application on Boxing Day, due to be heard by the ISA on February 6, 2014 – not next year as previously reported.
The application is for an area of 75,000km², about two-thirds the size of New Zealand's North Island, and it is estimated to contain $278 billion in minerals.
Today, Gerald McCormack of the Natural Heritage Trust explores at the complex history of the Clarion-Clipperton Zone nodule field and how developing countries can share in the wealth of this immense mineral resource.

CCZ discovered

THE FIRST manganese nodules were found in the Siberian sea in 1868. In the 1870s HMS Challenger, the first oceanic research ship, found them on the deep seabed of the Pacific and other oceans.

During the 1950s, new seafloor surveys showed that nodules were particularly common in the international waters in the northeast Pacific between Hawai'i and Mexico at a depth of 3500-5500 metres. The area was bordered by two immense rifts in the ocean floor: the Clarion Fracture Zone in the north, and the Clipperton Fracture Zone to the south. The area is now known as the Clarion-Clipperton Zone (CCZ).

There was little commercial interest in the nodules until the 1965 publication of "Mineral resources of the sea", in which John Mero estimated there were millions of tonnes of valuable manganese, nickel, copper and cobalt on the deep seabed. The race was on to explore and harvest the nodules.

The nodules became known as Polymetallic Nodules because they contain several commercially valuable metals, and during the late 1960s several consortia from different countries started working in the Clarion-Clipperton Zone (CCZ). There were extensive sampling surveys; three consortia experimented with harvesters and raised a couple of thousand tonnes. However, after 1976 the price of nickel collapsed and the enthusiasm for commercial mining at the limits of technology waned.

Although commercial harvesting became a distant objective, countries and consortia continued to lay the groundwork for future harvesting in the CCZ with extensive research on the nodules and their associated physical environment and biodiversity.

There is a bewildering array of estimates and re-estimates of the size of the nodule field and the weight of nodules along with their metallic composition and commercial value. The illustration shows the areas that have been staked out by consortia and they are packed like sardines in an area of about 2 million km². By comparison, the mineable Cook Islands Nodule Field of above 5kg/m² is about 650,000km², one third the size of the area delineated in the CCZ.

A common heritage

In 1970 the United Nations General Assembly declared that the seabed resources beyond national jurisdiction are the common heritage of mankind. The UN followed up in 1973 with the third UN Conference on the Law of the Sea (UNCLOS III) which finished in 1982 with the adoption of the UN Convention on the Law of the Sea (UNCLOS).

The adoption involved 130 votes in favour, 4 against (Australia, Germany, the United Kingdom and the United States of America) and 17 abstentions.

UNCLOS came into force in November 1994 and it has now been ratified by 166 parties (165 countries and the EU), with Cook Islands as the 72nd party ratifying in February 1995.

> *After years and years of investing in negotiations and research the pioneers will be keen to move to exploitation/ mining licences to reap their rewards.*

Three of those "against adoption", Australia, Germany and the UK, have now ratified the Convention. The other "against adoption", the US, signalled its acceptance of the principles by signing in 1994, but it has not ratified and is therefore not a member of UNCLOS. There are 13 other countries with coastlines that have not ratified the convention but none of these are involved in the CCZ nodule field.

UNCLOS established procedures to determine national jurisdiction of the oceans and its resources. These include the 200nm EEZs regime under which the Cook Islands has 1,831,000km² of ocean, and the Extended Continental Shelf (ECS) regime under which the Cook Islands applied in 2009 to extend its oceanic jurisdiction by about 23 per cent (413,000km²). To manage the seabed resources beyond national jurisdiction, Part XI of UNCLOS established the International Seabed Authority (ISA), which came into existence when the convention came into force in 1994.

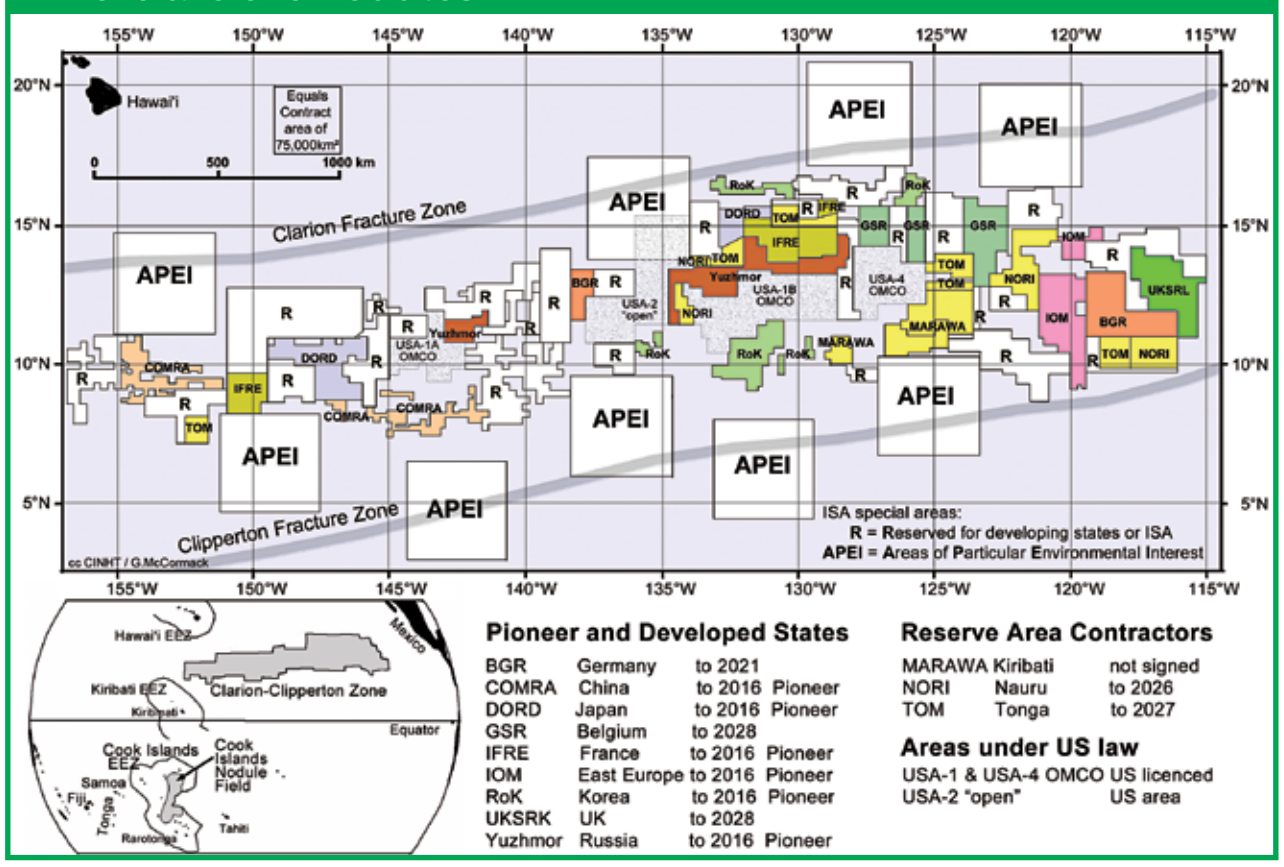
Life before ISA

Research has been ongoing in the CCZ since the 1950s, and after 1970 several countries and consortia were putting immense amounts of time and money into research and were starting to claim particular areas based on the traditional principle of "freedom of the seas" beyond national jurisdiction.

With the adoption of UNCLOS in 1982, the management of CCZ anticipated the coming into force of Part XI, which declared that "the area of the seabed and ocean floor and the subsoil thereof, beyond the limits of national jurisdiction, as well as its resources, are the common heritage of mankind, the exploration and exploitation of which shall be carried out for the benefit of mankind as a whole, irrespective of the geographical location of states". The "against adoption" countries objected to aspects of this section, such as ISA issuing permits, collecting fees and taxes for wealth redistribution and its own costs, and the mandatory transfer of research information and technology.

In 1982, in addition to UNCLOS being adopted, an "In

Where are the nodules?



Pioneer and Developed States

BGR	Germany	to 2021	
COMRA	China	to 2016	Pioneer
DORD	Japan	to 2016	Pioneer
GSR	Belgium	to 2028	
IFRE	France	to 2016	Pioneer
IOM	East Europe	to 2016	Pioneer
RoK	Korea	to 2016	Pioneer
UKSRK	UK	to 2028	
Yuzhmor	Russia	to 2016	Pioneer

Reserve Area Contractors

MARAWA	Kiribati	not signed
NORI	Nauru	to 2026
TOM	Tonga	to 2027

Areas under US law

USA-1 & USA-4 OMCO	US licenced
USA-2 "open"	US area

The lower left illustration shows the location and relative size of the CCZ and the Cook Islands Nodule Field. The top illustration shows the contract areas allocated to pioneers and developing countries, with the Belgium-sponsored area to GSR being in the top-right in three dark green blocks. The ISA reserve areas are marked 'R', except the three already taken by Nauru (NORI), Tonga (TOM) and Kiribati (MARAWA). The nine large APEI blocks are biodiversity preserves for abyssal species to re-colonise the contract areas after they have been extensively disturbed to extract the nodules. 14010913