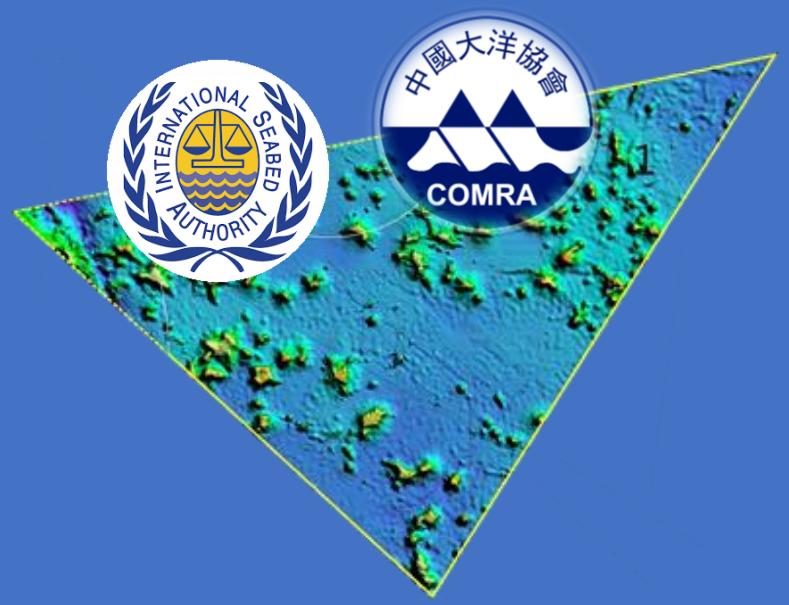


# Development of REMP for the Cobalt-Rich Ferromanganese Crusts in Triangle Area in the Northwest Pacific Ocean

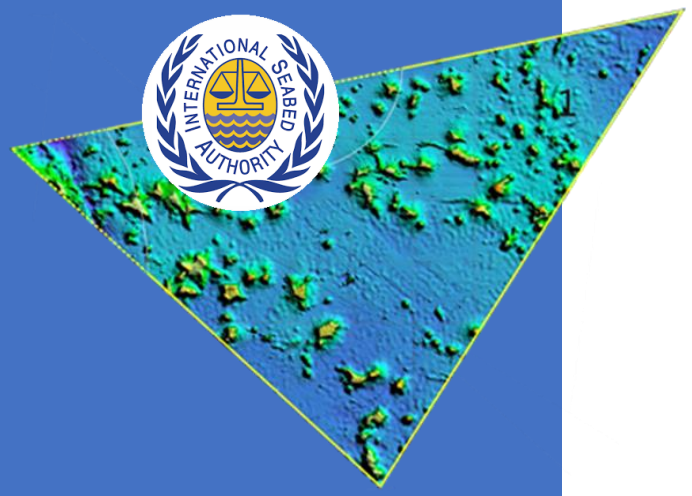
## —— Outcomes of the Qingdao Workshop


China Ocean Mineral Resource R & D Association (COMRA): LIU Feng, *et al.*

國家海洋局第二海洋研究所
Second Institute of Oceanography,SOA

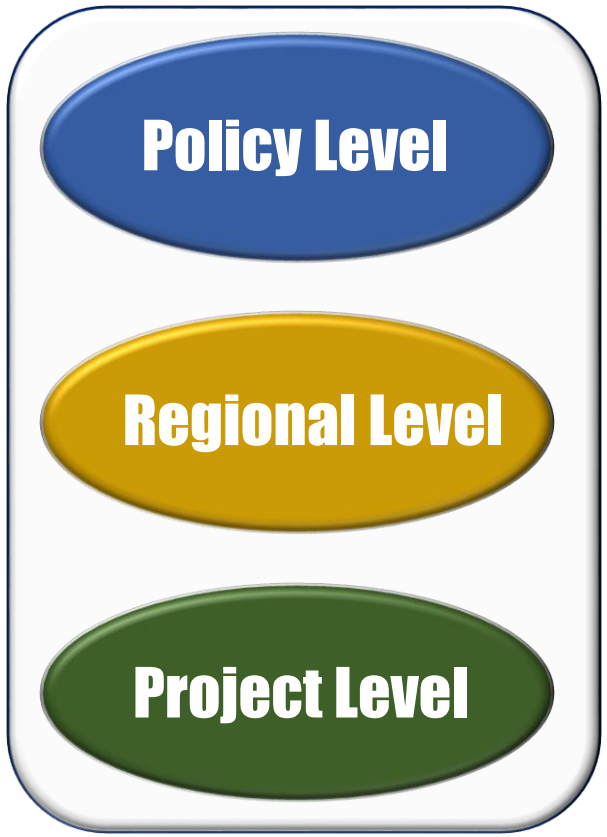
**XU Xue-Wei**


**14/09/2018 in New York**



- Background
- Preliminary Thinking
- Outcomes and Next Step

# Objective of Regional Environmental Management Plan



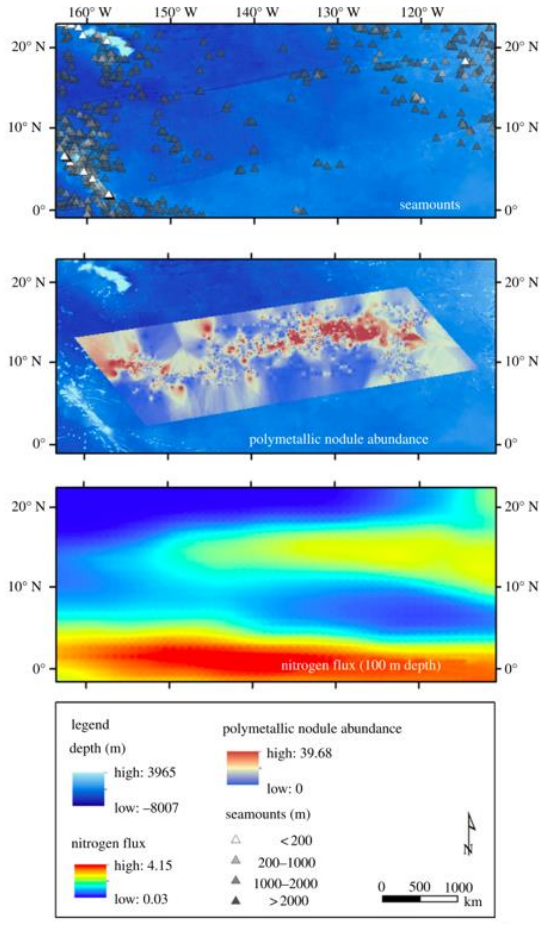

Hierarchy of EMP levels
*--ISA TS No. 18*

**The objective of REMP (ISBA/24/C/3)**
to provide the relevant organs of the Authority, as well as contractors and their sponsoring States, with **a proactive area-based management tool** to support informed decision-making that **balances resource development with conservation**.

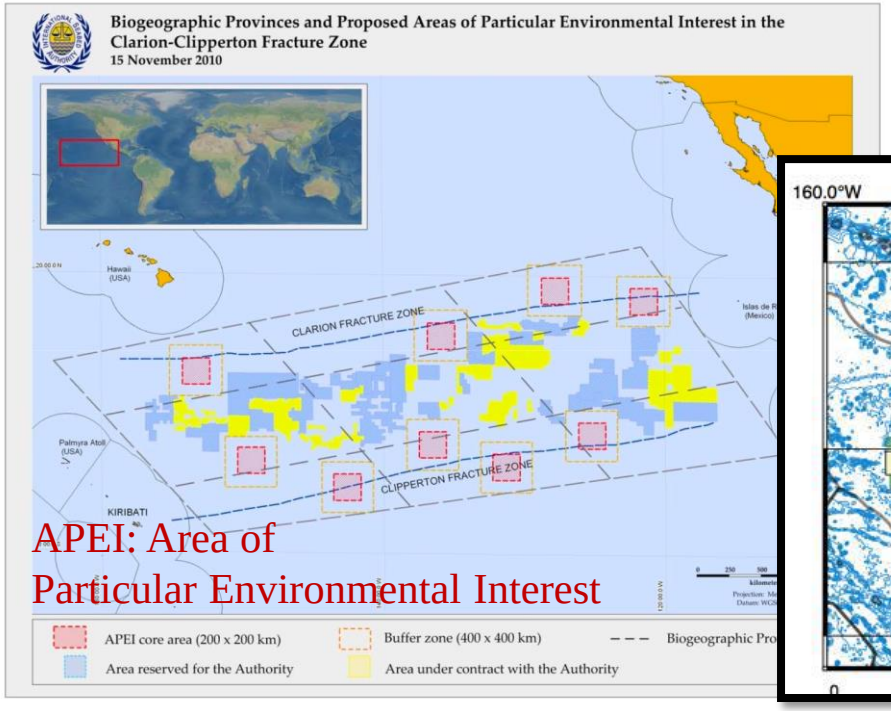
REMPs also provide the Authority with a clear and consistent mechanism to identify **particular areas** thought to be representative of the full range of habitats, biodiversity and ecosystem structures and functions within the relevant management area, and provide those areas with appropriate levels of protection, thus **helping the Authority to meet internationally agreed targets, such as Aichi Biodiversity Target 11**.

# Clarion-Clipperton Zone REMP

Science-based recommendations



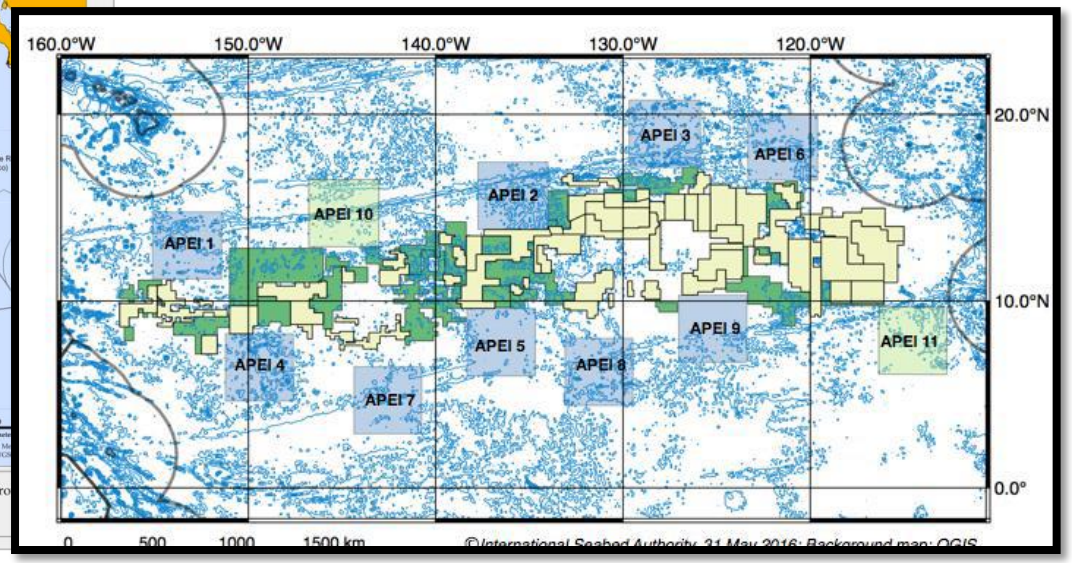

Wedding *et al.*, 2013




APEI: Area of Particular Environmental Interest

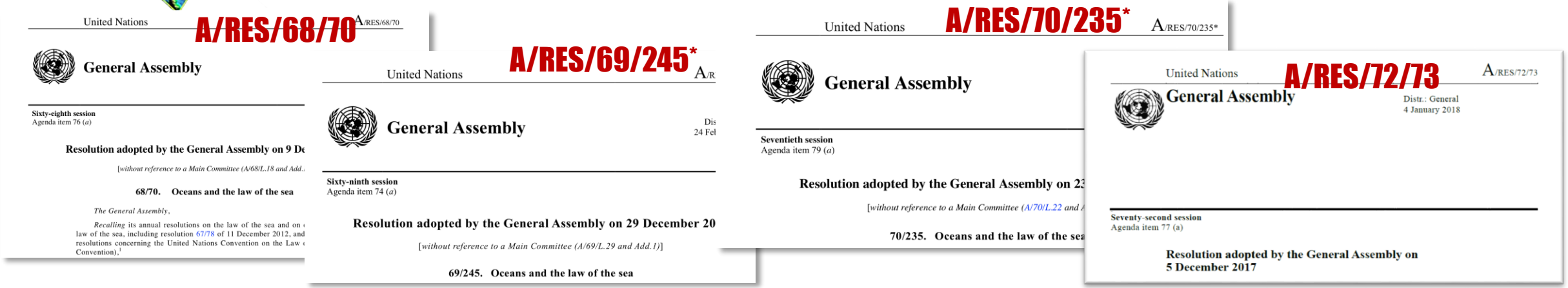
ISBA/17/LTC/7, 2011

Maps from the ISA




**The environmental management plan of the Clarion-Clipperton Fracture Zone is the first and the only REMP developed to date by the Authority.**

# Resolutions Adopted by General Assembly of the UN




71. *Notes* that a workshop dedicated to the review of the status of implementation of the environmental management plan for the Clarion-Clipperton Zone will be held during the first half of 2018, and encourages the Authority to make progress on the development of environmental management plans in other specific areas in the Area, in particular where there are currently exploration contracts, recalling paragraph 60 of resolution 70/235;

*-- from Resolution adopted by the General Assembly on 5 December 2017*

# ISA Council's Documents


16. *Encourages* the Secretariat and the Commission to make progress on the development of environmental management plans in other international seabed area zones, in particular where there are currently exploration contracts, recalling paragraph 60 of General Assembly resolution 70/235 of 23 December 2015;

*--from Report of the Chair of the Legal and Technical Commission on the work of the Commission at its twenty-third session*

# Preliminary Strategy for the Development of REMPs for the Area


**Twenty-fourth session**
Council session, part I
Kingston, 5–9 March 2018
Agenda item 10*

**ISBA/24/C/3**

**Report of the Secretary-General on the implementation of the decision of the Council in 2017 relating to the summary report of the Chair of the Legal and Technical Commission**

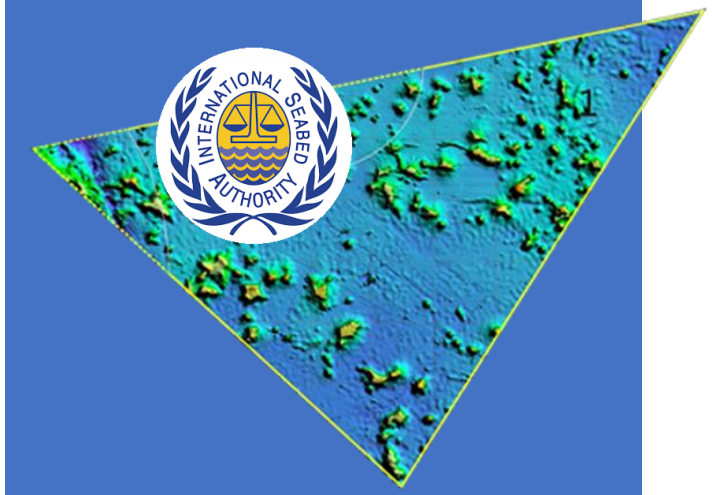
**Preliminary strategy for the development of regional environmental management plans for the Area**

**Report of the Secretary-General**

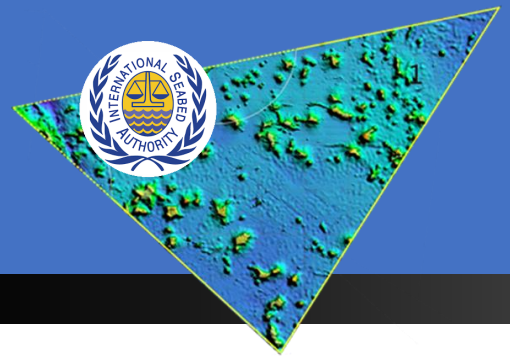
Photos in the 24th Session

## IV. Short-term strategy and recommendations

12. In the light of such constraints and considering the current status of exploration in the Area, the priority areas for development of regional environmental management plans in the Area have been identified on a preliminary basis as the Mid-Atlantic Ridge,[6] the Indian Ocean triple junction ridge and nodule-bearing province,[7] as well as the North-west Pacific and South Atlantic for seamounts.[8]



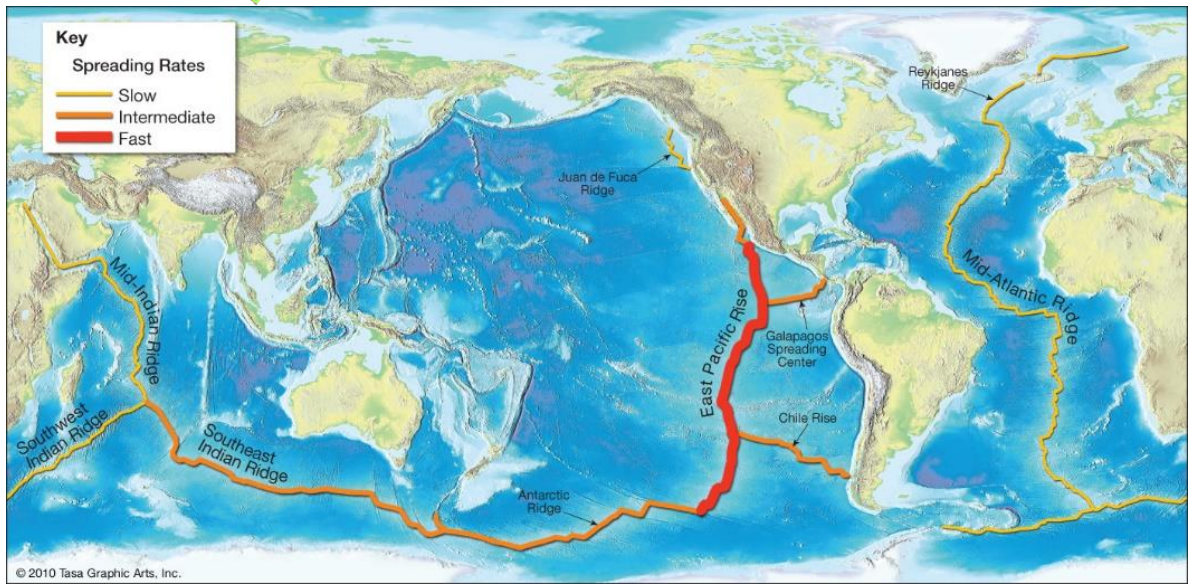

- Background
- Preliminary Thinking
- Outcomes and Next Step



# Differences among Three Resources Areas

| Resources | Polymetallic Nodules | Polymetallic Sulfides | Cobalt-Rich Crusts |
|---|---|---|---|
| **Typical topography** | Abyssal plain (table) | Ocean ridge (belt) | Seamount (dot) |
| **Representative areas** | CCZ | Mid-Atlantic Ridge, Indian Ridge | Triangle Area in the Northwest Pacific Ocean |
| **Food resource and pattern** | Photoautotroph (upper ocean) Uniform distribution | Chemoautotroph (hydrothermal fluid) Shaped distribution | Photoautotroph (upper ocean) Inhomogeneous distribution |
| **Benthos distribution characteristics** | Longitude and latitude (table, 1D) | Distance away from ridge (belt, 1.5D) | Height of seamounts (dots, 2D) |
| **Complexity for connectivity** | + | ++ | +++ |
| **REMP** | + | - | - |

# Distribution of Seamounts




Map from cooklowery13

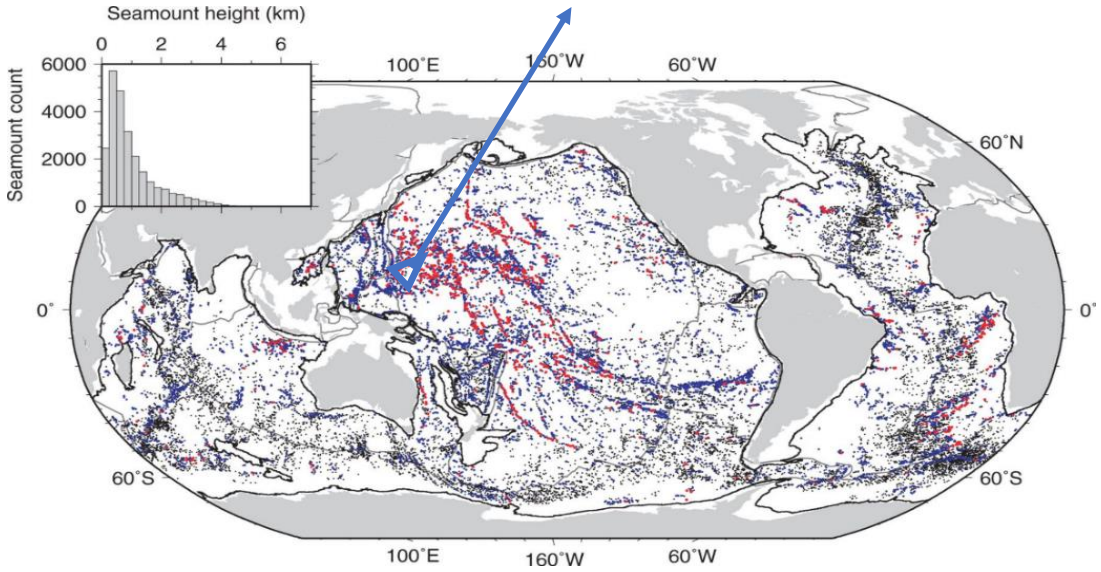
**Black: 0.1 ≤ h < 1 km (n = 16,185)**

**Blue: 1 ≤ h < 3 km (n = 7514)**

**Red: h ≥ 3 km (n = 944)**

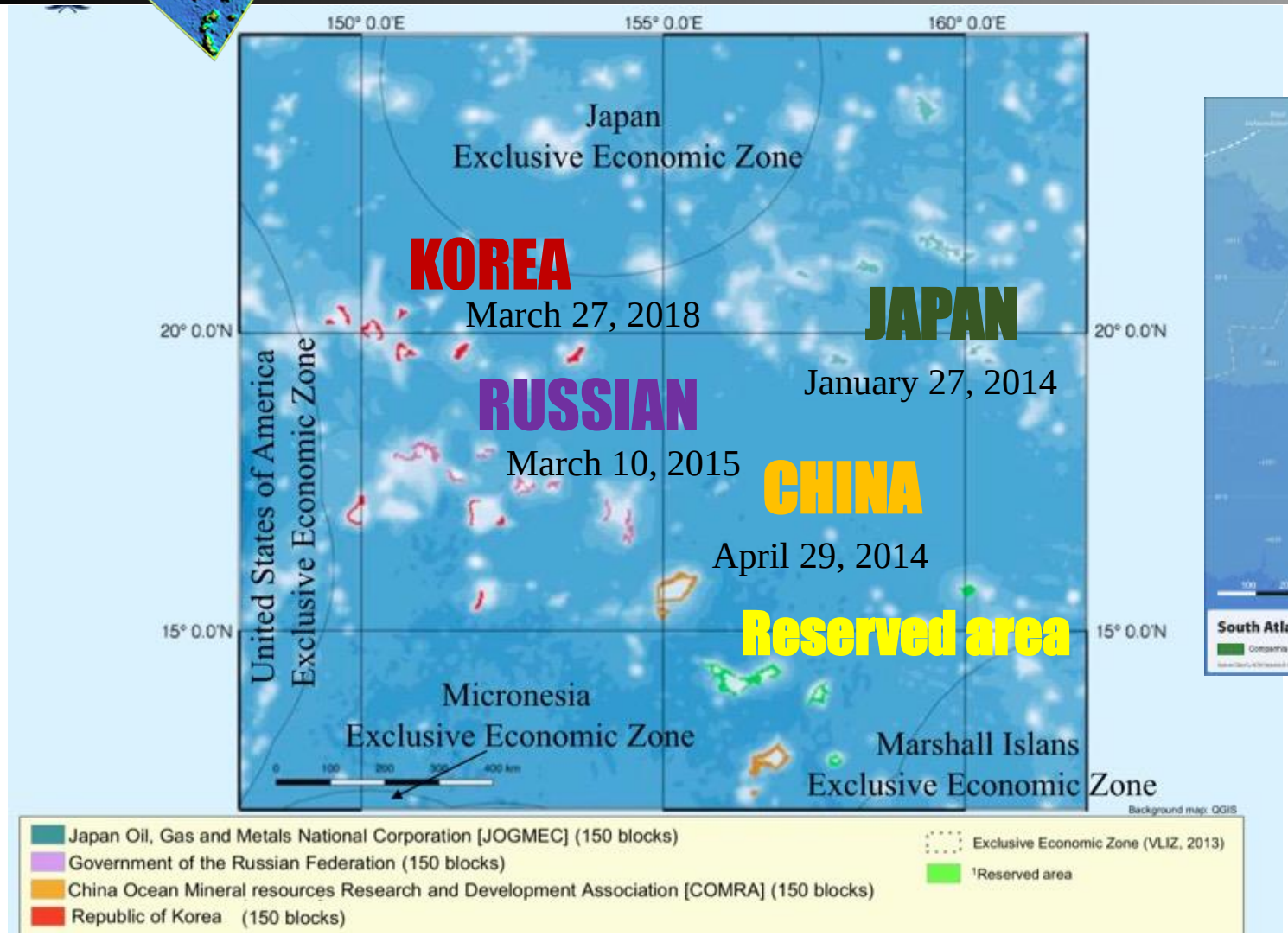
**Distribution pattern of seamounts (crusts) is dotted, which is different with that of abyssal plain (PMN) and ocean ridge (PMS).**

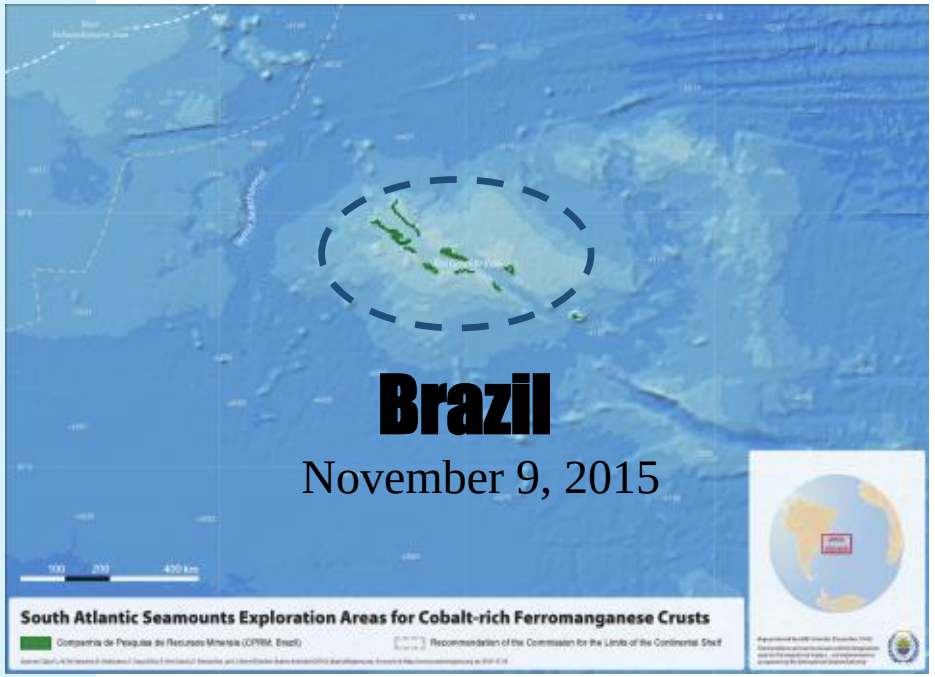
**Triangle Area in the northwest Pacific Ocean**




Map from Kim & Wessel (2011) Geophys J Int

# Contract for Cobalt-rich Ferromanganese Crusts




South Atlantic Ocean

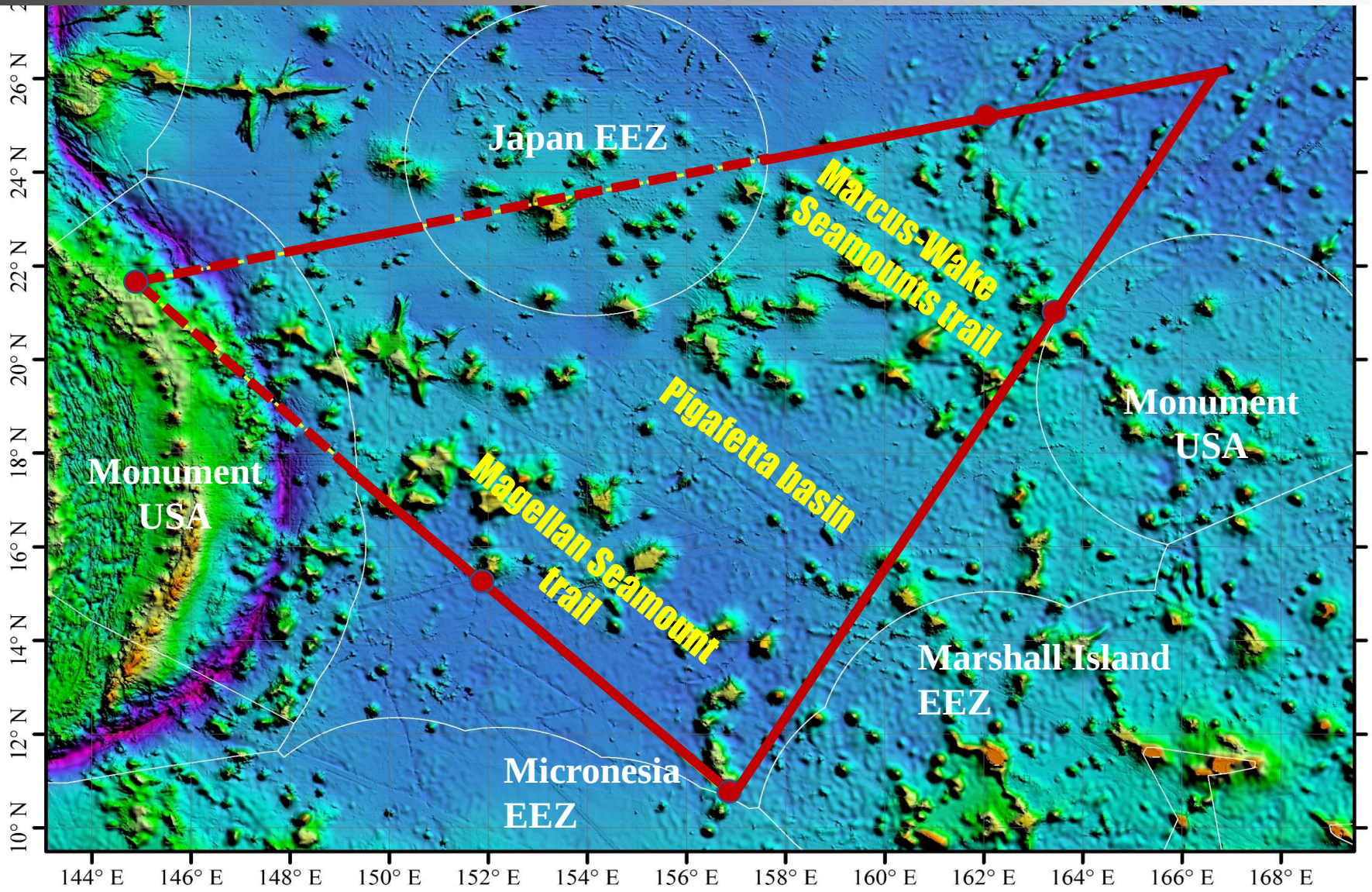
Map from ISA

# Triangle Area within the Northwest Pacific Ocean

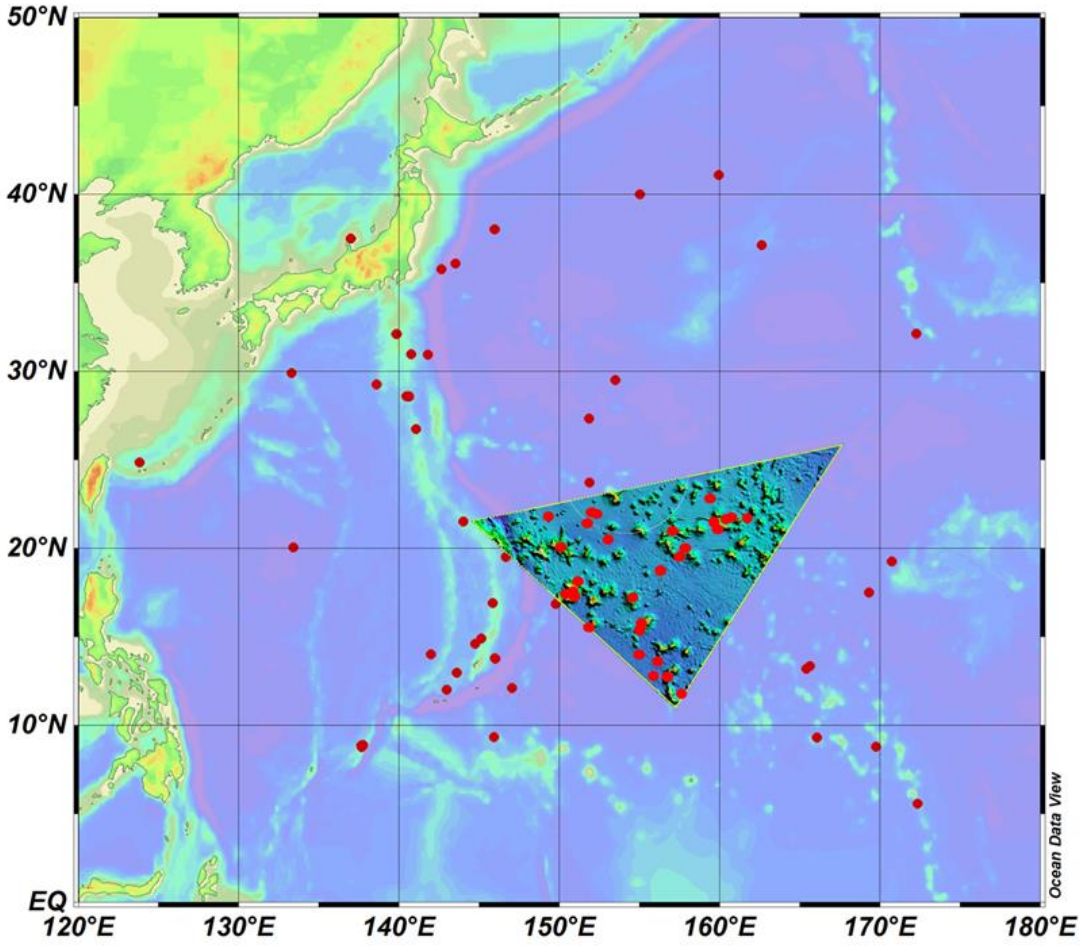
White curves represent the areas within 200 n miles of island, including EEZ and US monument.

Ave. depth of top: 1524 m (n=38)
Ave. altitude: 3578 m (n=38)

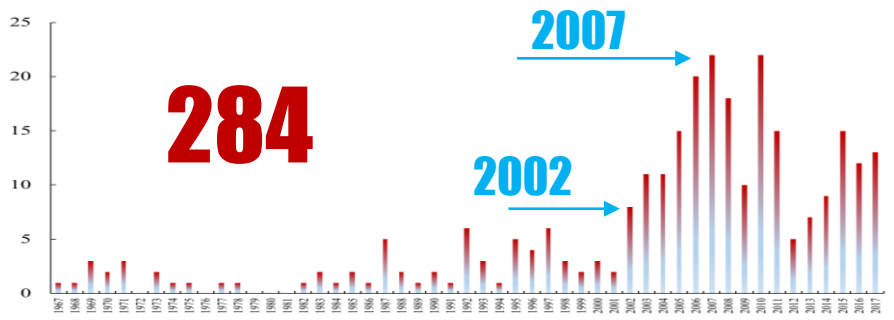
- **Area: 1.74 million km²**
- **Seamount: ~227 thousand km²**



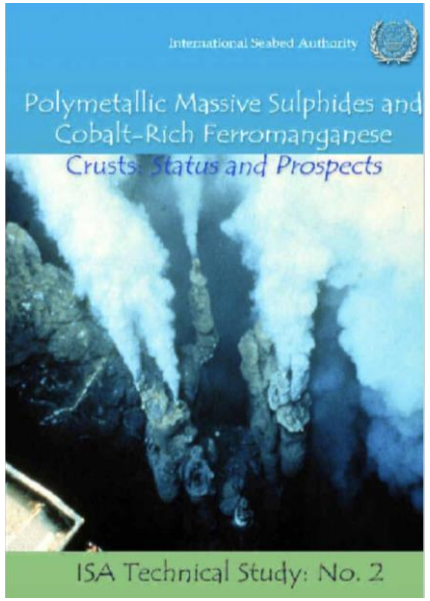
# Current Knowledge

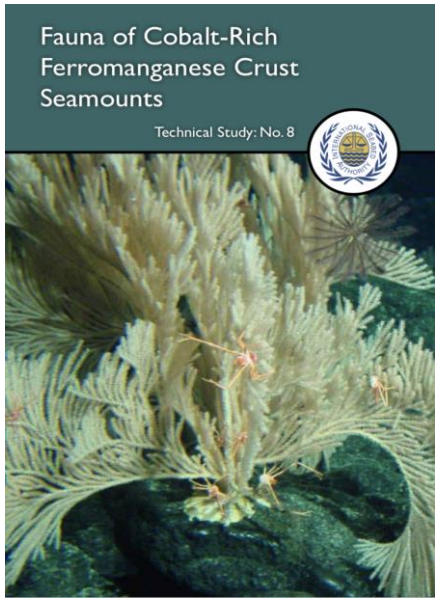



Publications regarding the northwest Pacific

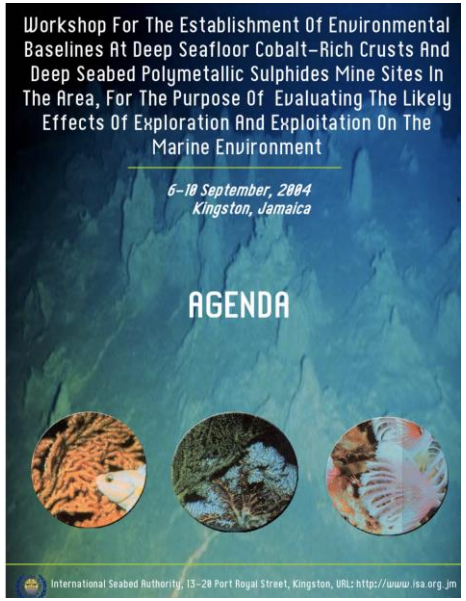






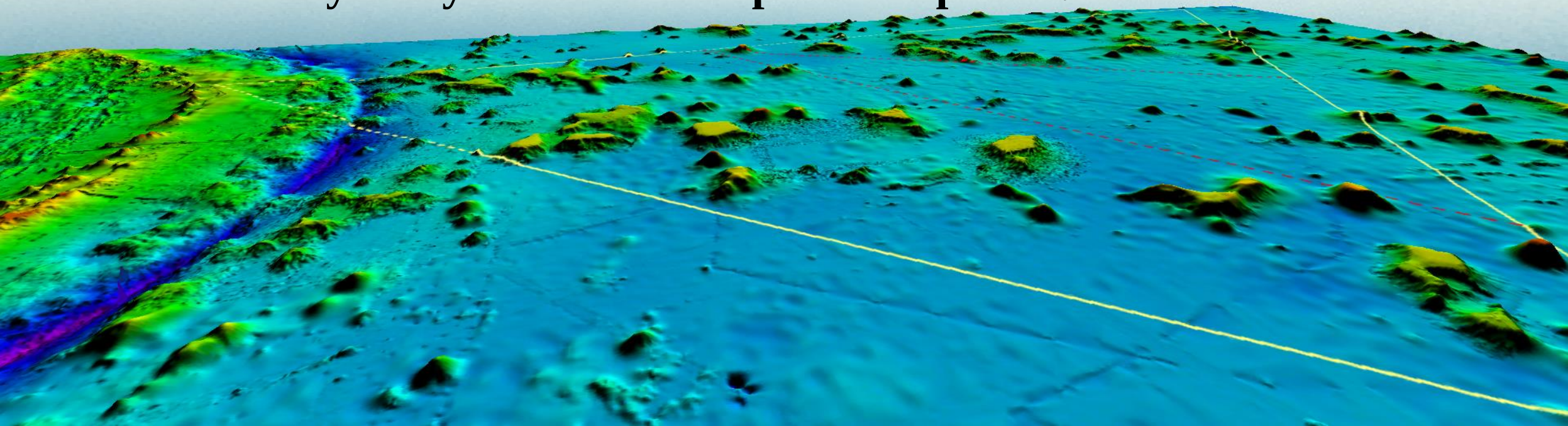

ISA Technical Study

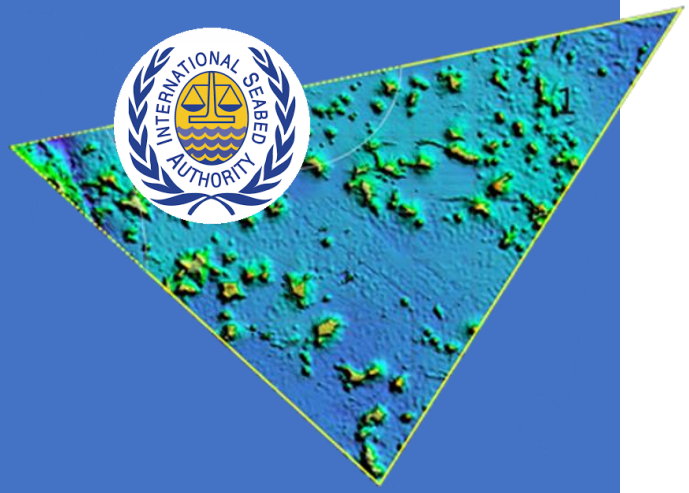



Workshops

# Key Scientific Questions

- What factors determine the delineation of biogeographic provinces in the seamount area?
- How do topographic features affect biodiversity?
- How does hydrodynamics affect species dispersal?





- Background
- Preliminary Thinking
- **Outcomes and Next Step**

# Contractor of China: COMRA
## China Ocean Mineral Resource R&D Association

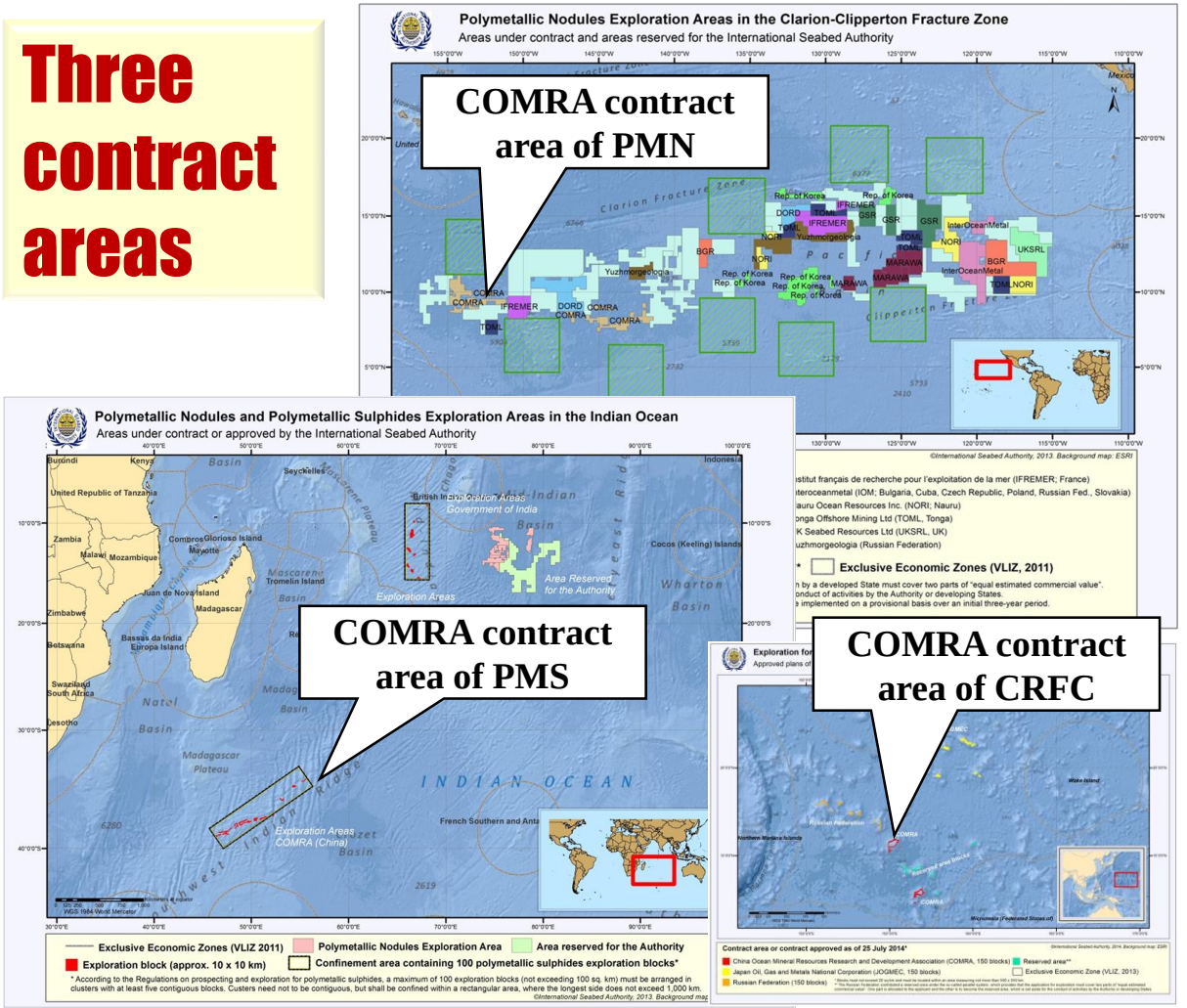
### Three main purposes

- to explore new resources and promote the establishment of a deep sea industry
- to increase cognition of the deep sea environment and development of the sea technology & equipment
- to participate in the regime development of the Area for the peaceful utilization

### Three main functions

- to coordinate activities in the Area and deep sea of various institutions in China
- to manage the fund from Central Government for R&D and implementing the deep sea programs
- to fulfill the obligations as required of a contractor

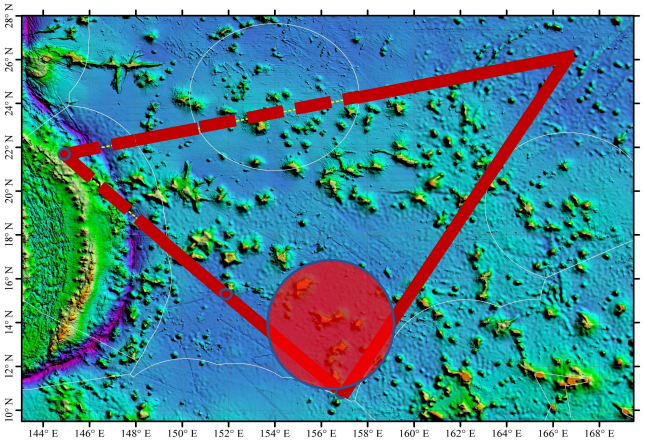
### Three contract areas



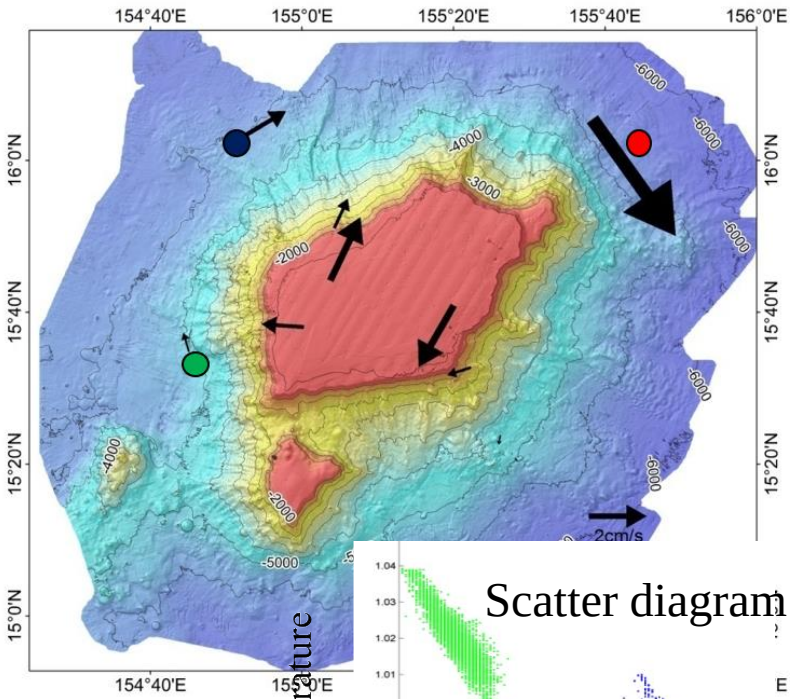
# COMRA Surveys in Triangle Area

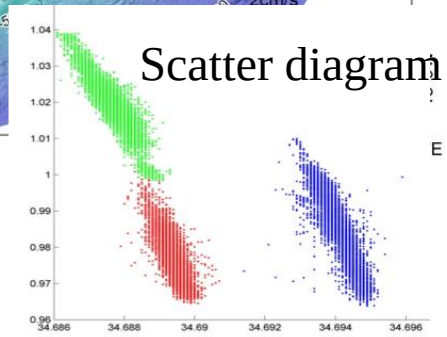
**In the last 6 years, 9 cruises have been conducted** for environment surveys as well as resources exploration.





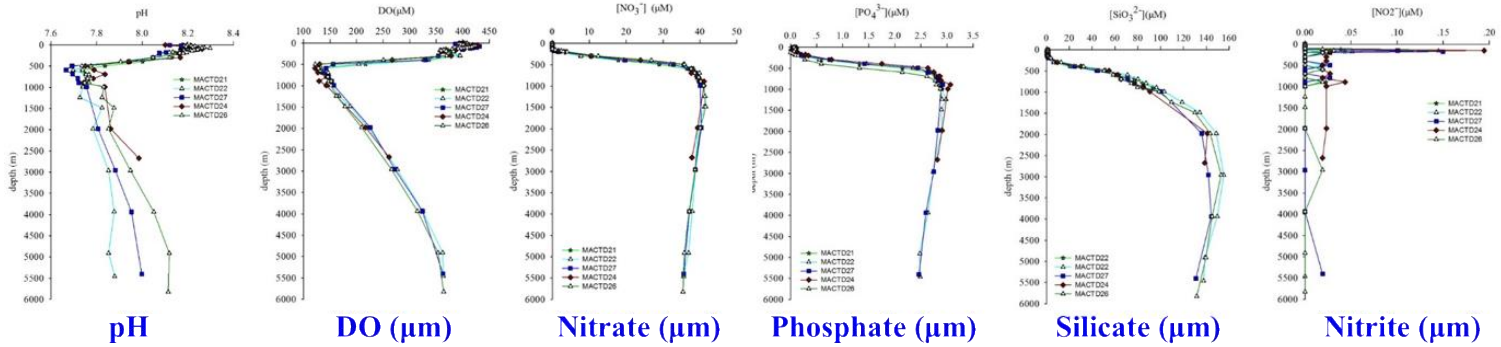
# COMRA Surveys in Triangle Area




Scatter diagram

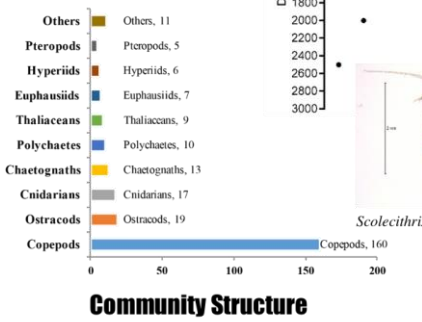
Physical oceanography

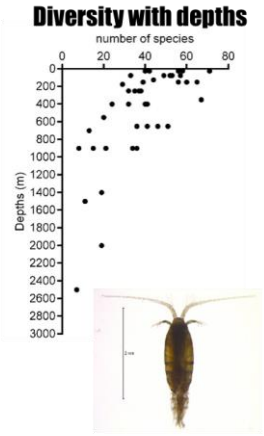



Chemical oceanography

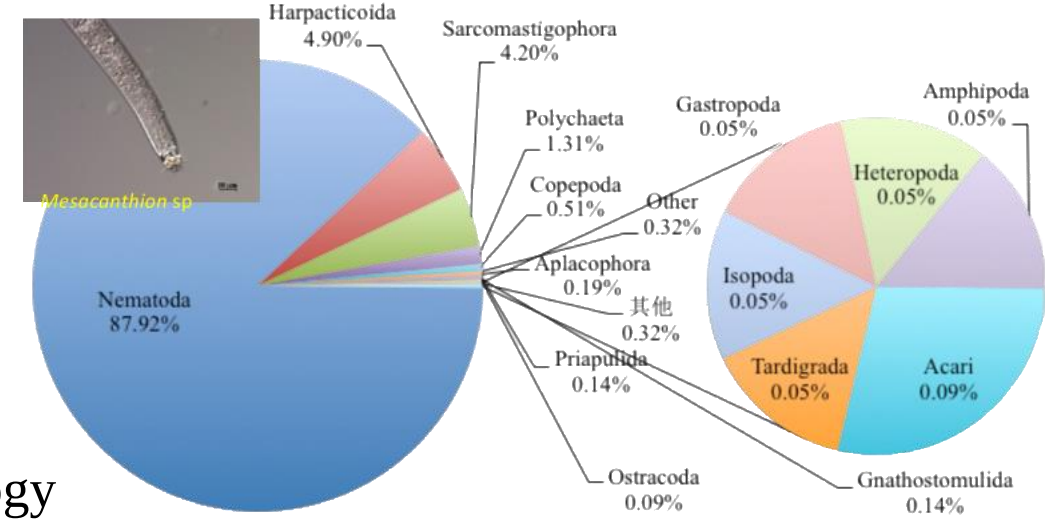
**Biodiversity**

- 10 groups
- 257 species
- 62% Copepods




*Scolecithrix danae; by Sun*

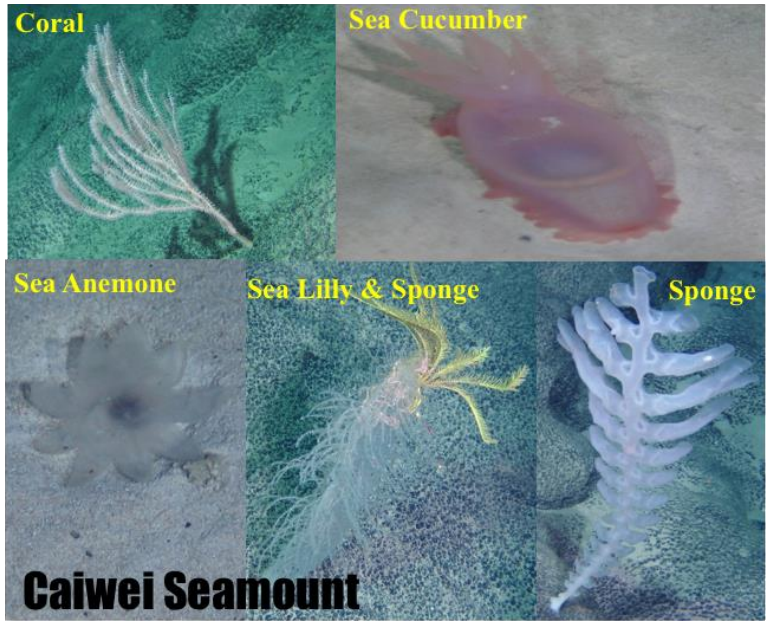



Biology

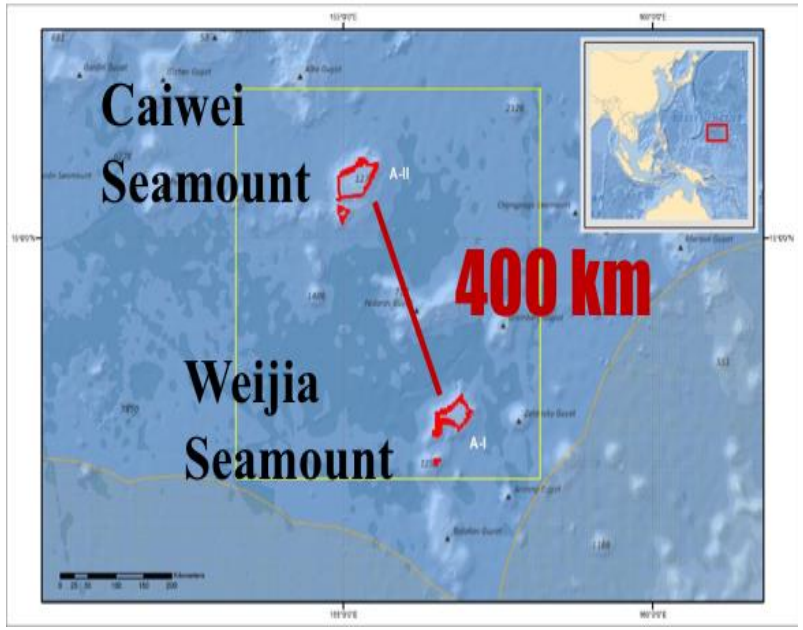
# COMRA Surveys in Triangle Area

## Megafauna distribution and connectivity

1. Similar community composition between the top and the slope, dominated by sponge and coral.
2. Similar dominant taxa were found between Caiwei seamount and Weijia Seamount.







# Proposal by the COMRA

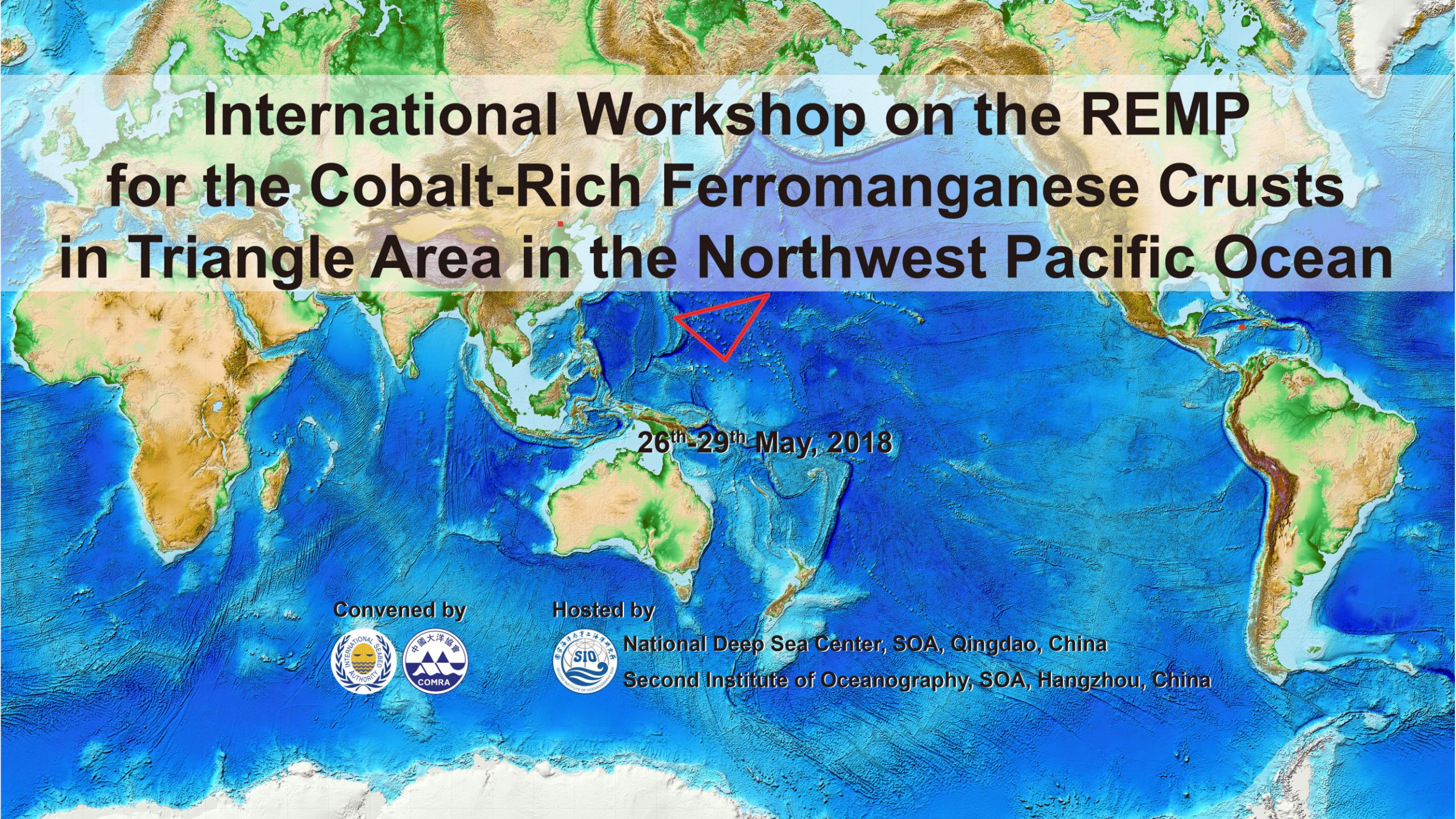
During the 23rd session, the COMRA proposed to develop a REMP for the cobalt-rich crusts located in the northwest Pacific through a cooperative effort.

Photos from Side Event


**ISBA/23/C/8: Report of Secretary-General**

23. The Secretary-General has taken note of the views expressed by the Council in this regard and proposes to give consideration to how best to initiate action in this respect, taking into account budgetary constraints. The Commission has also held a general discussion on the approach to the development of environmental management plans and the need for environmental data from contractors and open sources to be made available for that purpose. The Commission and the Secretary-General have also taken note of external initiatives to develop a scientific basis for an environmental management plan in the Atlantic Ocean, and they intend to hold discussions with relevant stakeholders on how the outcomes of such initiatives may help to advance the work of the Authority. The Secretary-General also held preliminary discussions with the China Ocean Mineral Resources Research and Development Association regarding its interest in pursuing a cooperative effort with other contractors to develop an environmental management plan for the cobalt-rich ferromanganese crust zones in the Pacific Ocean. This initiative is welcomed and further discussions will be held in due course.

# International Workshop on the REMP for the Cobalt-Rich Ferromanganese Crusts in Triangle Area in the Northwest Pacific Ocean



26th -29th May, 2018

Convened by

Hosted by

National Deep Sea Center, SOA, Qingdao, China

Second Institute of Oceanography, SOA, Hangzhou, China

# Chair & Steering Committee

## Co-chairman

**Michael Lodge**
Secretary-General
International Seabed Authority
Jamaica

**Feng Liu**
Secretary-General
China Ocean Mineral Resource R&D Association
China

## Steering Committee

**Xue-Wei Xu**
Second Institute of Oceanography, State Oceanic Administration
China

**Irina Ponomareva**
JSC Yuzhmorgeologiya
Russia

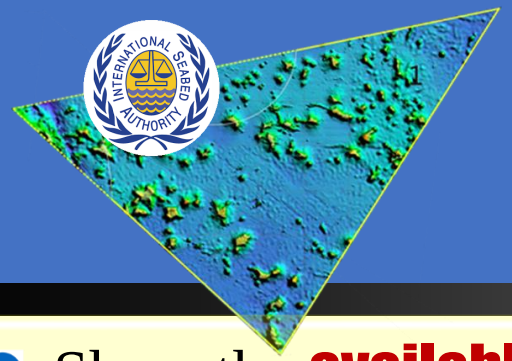
**Sang Joon Pak**
Korea Institute of Ocean Science & Technology
South Korea

**Pei-Yuan Qian**
Hong Kong University of Science and Technology
China

**Sandor Mulsow**
International Seabed Authority
Jamaica

**Yoshiaki Igarashi**
Japan Oil, Gas and Metals National Corporation
Japan

**Malcolm Clark**
National Institute for Water and Atmospheric Research
New Zealand



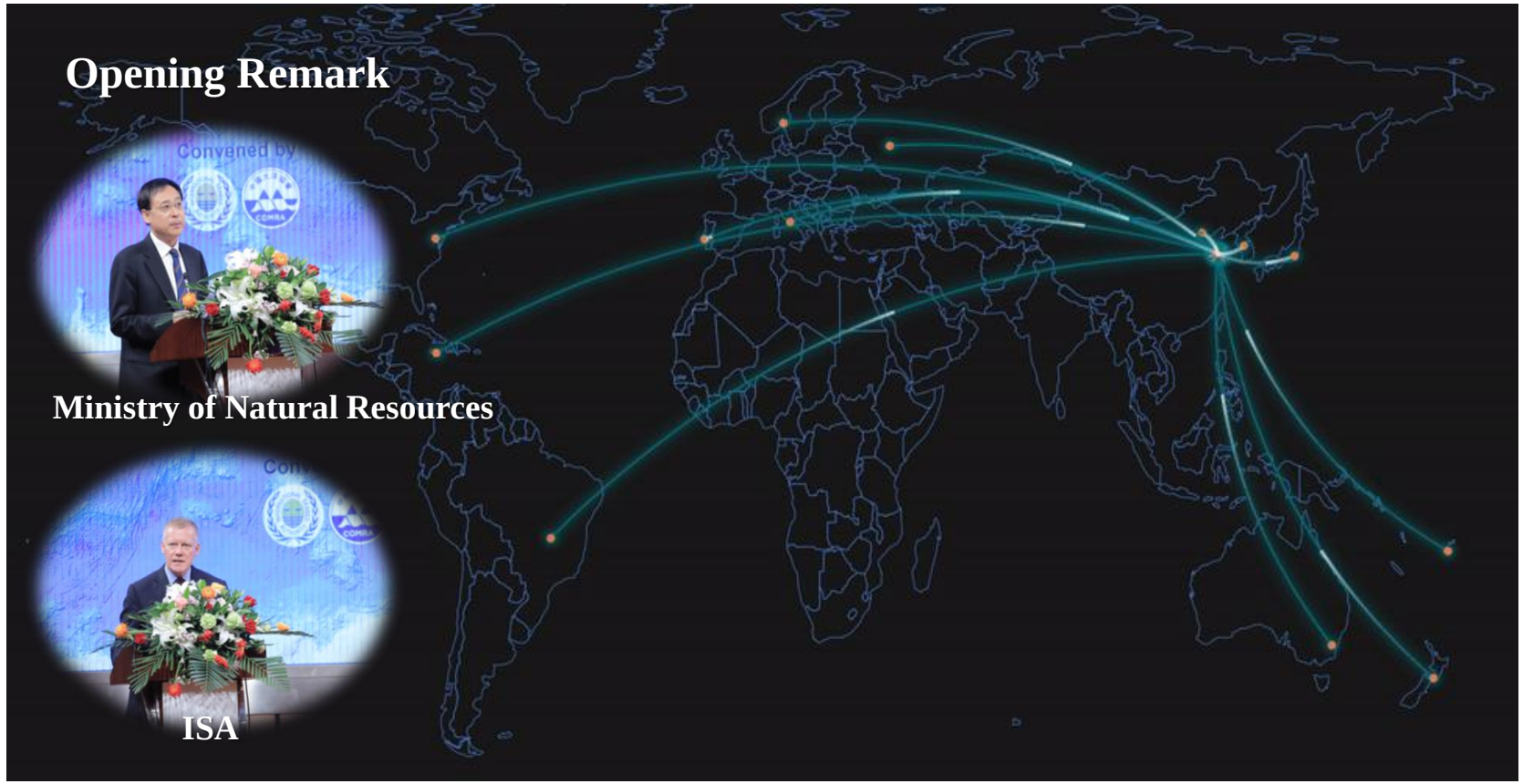
# Objectives & Themes

- Share the **available environmental data**, and understand the national, regional and international **policies and laws**;
- Find **a consensus on the design of the REMP** as well as the preliminary ideas for its framework;
- Create **a work plan for 2-3 years of scientific collaboration** to collect additional data needed for the design of the REMP;
- Discuss mechanisms for communication and coordination and establish an organizational structure, if needed.

- **Legal principles** for the REMP for the CRFC in the northwest Pacific;
- **Design principles for REMPs and scientific knowledge** available in Triangle Area;
- **Cooperation and sharing** of resources as well as a **roadmap** toward the creation of an REMP for the Triangle Area.

# Attendee & Session

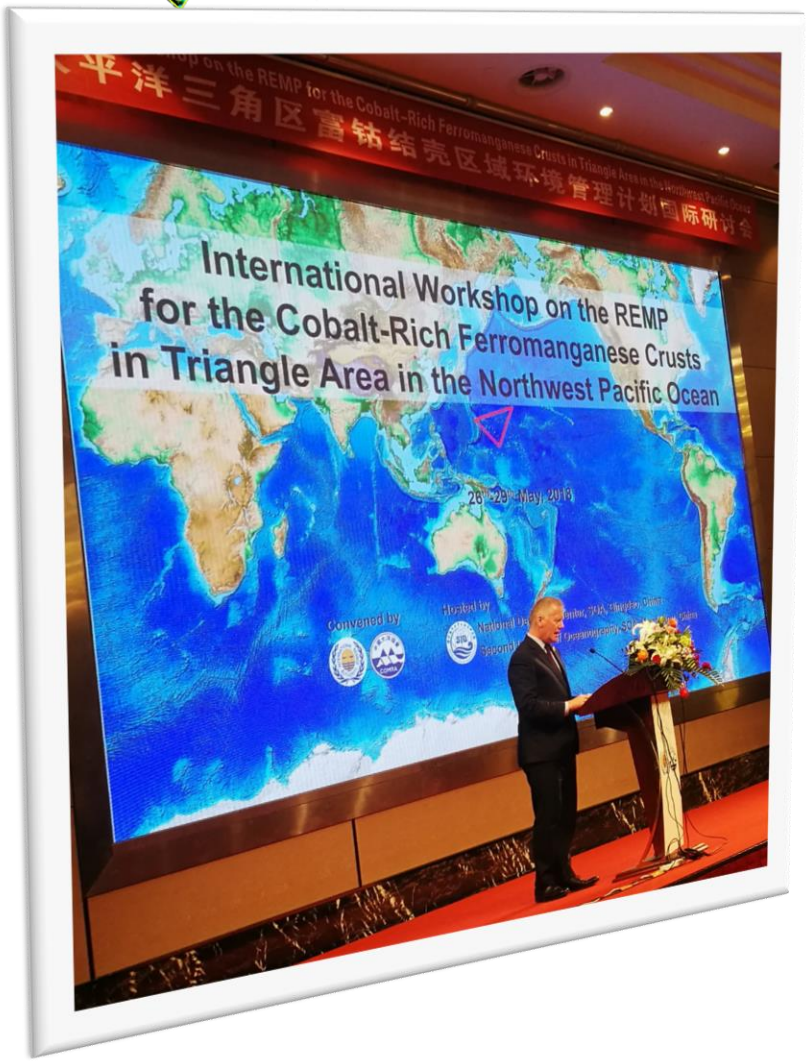
Totally **119** delegates as well as volunteers, including representatives of **contractors** and **international organizations**, **stakeholders**, **officers of United Nations and the ISA**, LTC members, and legal and scientific experts from academia and institutes, attended the Qingdao workshop.




## Three Sessions:

- **Legal Framework** (2 Presentations / 2 Group Discussions)
- **CRFC Habitat** (6 Presentations/ World Café Approach)
- **REMP Proposal and Perspective** (2 Presentations/ World Café Approach )

# Opening Remark




I would like to **highlight** three points:

First, in designing a REMP for the Triangle area, **many lessons might be drawn from the existing CCZ-REMP**, including the guiding principles, implementation methodology, design principles for APEIs, etc.

Second, **the Authority must provide guidelines** on the assessment and archiving of data and information on baseline studies.

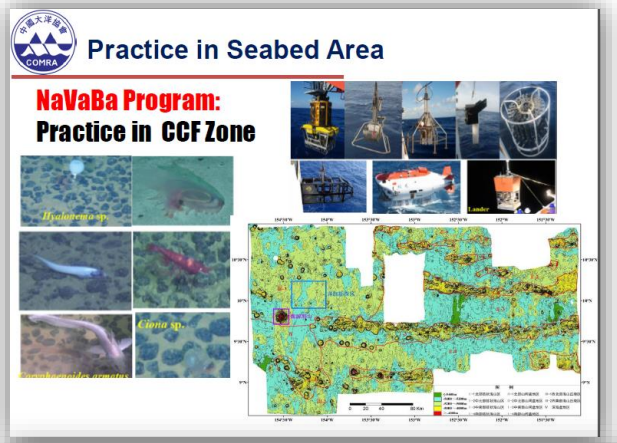
Third, the designing of REMPs relies on the **cooperation of stakeholders**.

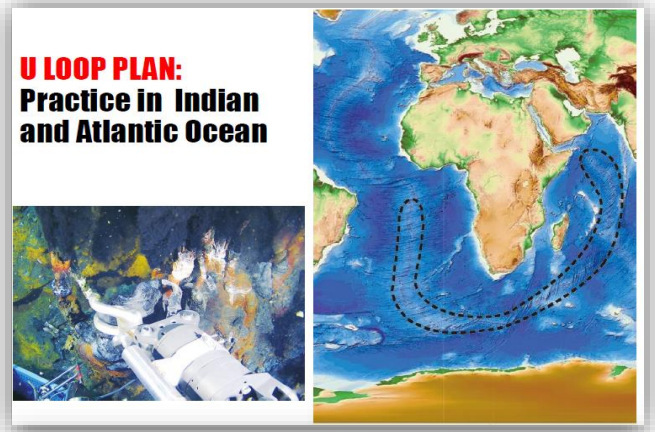
# Plenary Presentations

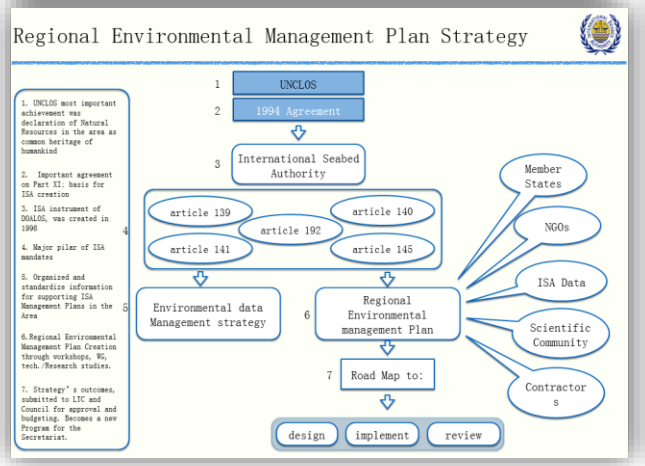
## Deep sea environmental policy & Deep sea environmental practice

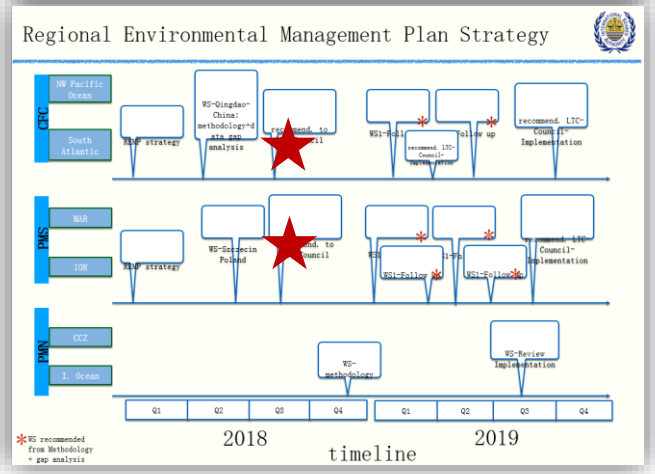
SG of COMRA
Mr. Liu Feng

Director of OEMMR, ISA
Dr. Sandor Mulsow




The four slides from speeches by Mr. Liu and Mr. Mulsow.

# Invited Presentations

## Session 1 Legal Framework

Yongsheng Cai


Cindy Lee Van Dover

## Session 3 REMP Proposal and Perspective

Xue-Wei Xu

Sandor Mulsow

## Session 2 CFC Habitat

Tina Molodtsova

Tomohiko Fukushima

Chunsheng Wang

Se-Jong Ju

Viacheslav Melnik

Akira Iguchi

https://www.isa.org.jm /workshop/workshop-development-remp-cobalt-rich-ferromanganese-crusts-northwest-pacific-ocean-26-29

# Working Groups



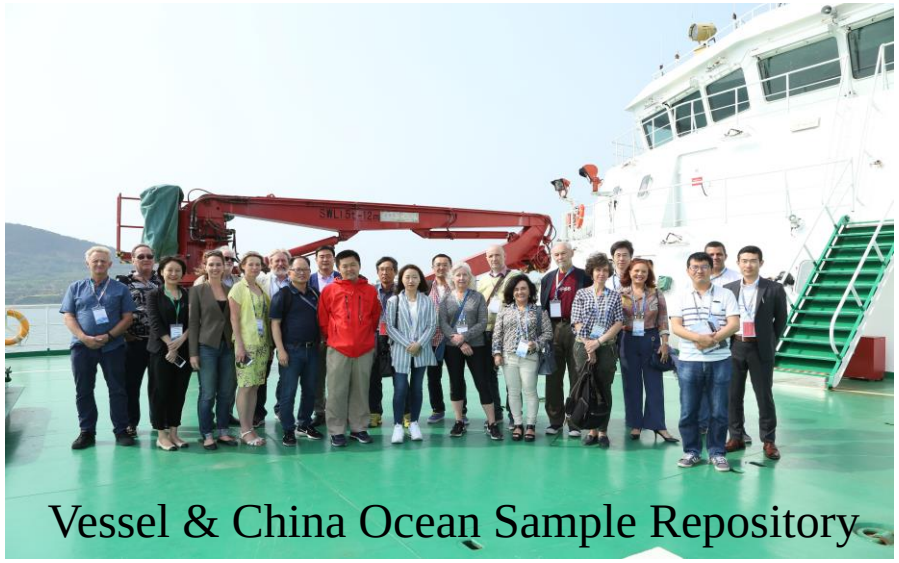


# Other Activities

Welcome Reception


Local News


National Deep Sea Center



Vessel & China Ocean Sample Repository

# Main Conclusions / Recommendations by WG1

## Conclusions

Guiding principles of the proposed REMP include: 1) common heritage of mankind; 2) precautionary approach; 3) protection and preservation of the marine environment; 4) prior environmental impact assessment; 5) conservation and sustainable use of biodiversity; 6) transparency; 7) use of best available scientific information, best available techniques and best environmental practice; 8) area based management tools

## Recommendations

Give due consideration to socio-economic aspects, taking into account the following factors: 1) contract areas; 2) exclusive economic zones and continental shelves of the coastal states surrounding the Triangle Area; 3) other marine activities, including fishing, laying of cables and pipelines, shipping; 4) migratory pathways; 5) maintenance of population of endemic species

# Main Conclusions / Recommendations by WG2

## Conclusions

- Seamounts are potential stepping stones for species dispersal, have high faunal abundance and biomass, and are the hotspots of biodiversity at a global
- Species composition and spatial distribution of benthic assemblages are influenced by environmental factors which are interplaying, and are closely related to the water depth; the role of cobalt-rich crusts in determining benthic assemblages remains unclear
- Science is the key to develop a robust REMP that can fits into regional policy or meet administrative requirement

## Recommendations

- Conduct “gap” analysis of baseline information and collect necessary data by contractors
- Consider developing “atlas” for the Triangle Area by the ISA
- To designate APEI in the Triangle Area, follow the general guidelines set by the ISA for the CCFZ with consideration of complexity of seamount ecosystem
- To designate APEI, include the entire seamount to protect ecosystem integrity; APEI shall not overlap with contract area as well as reserved area

# Main Conclusions / Recommendations by WG3

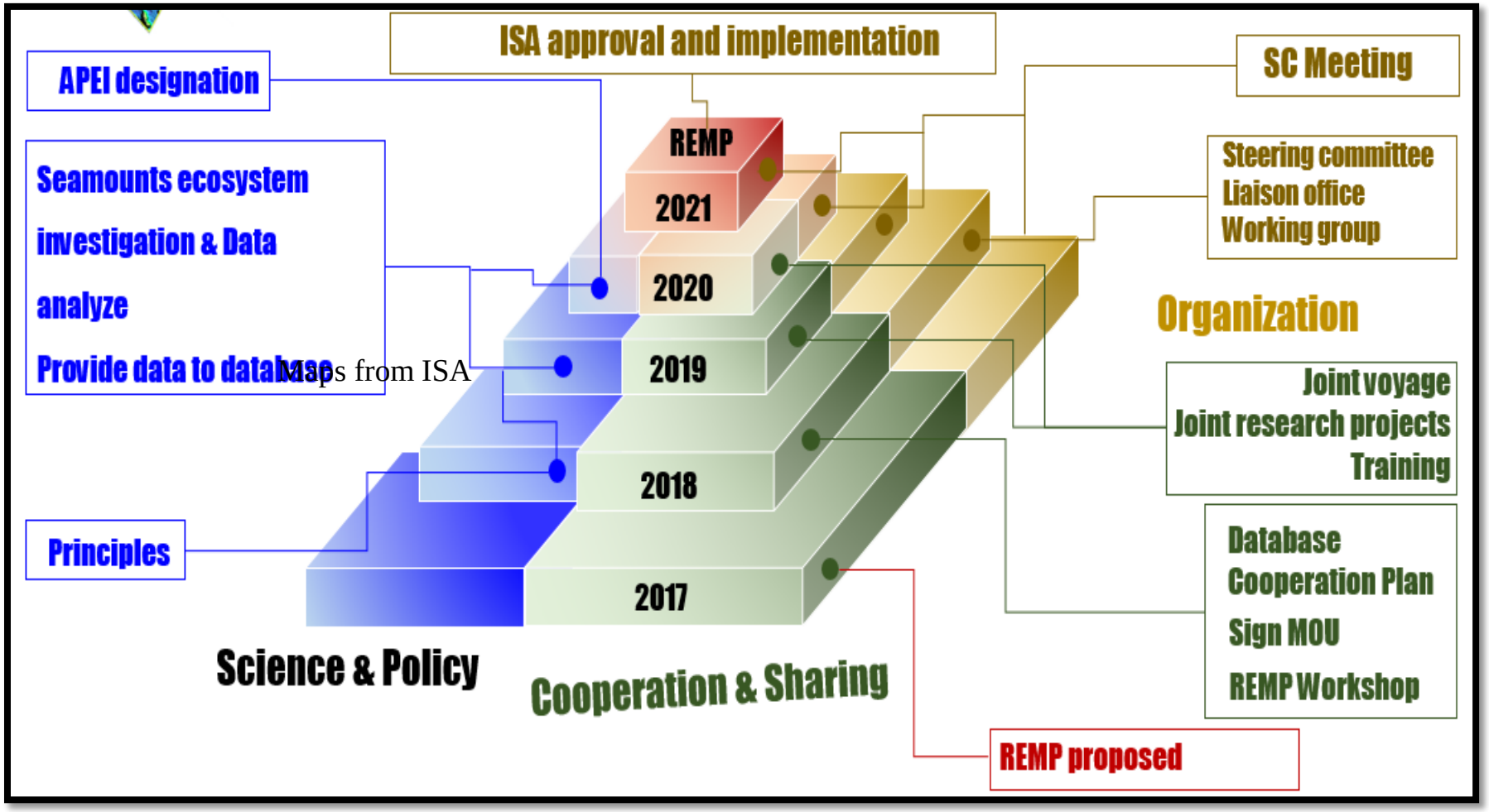
## Conclusions

- Data sharing should be realized as soon as possible to promote the development of the REMP; Scope and time limits of confidential data should be defined
- The ISA, contractors, and other organizations should carry out a variety of cooperation and communications in order to discuss important scientific issues as well as promote data sharing and standardization

## Recommendations

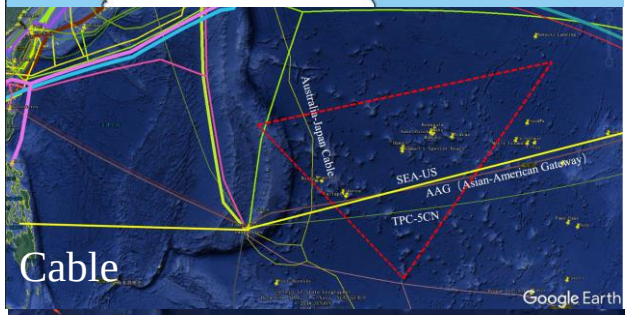
- Besides data from contract areas mainly provided by contractors, encourage contractors and countries in/around the Triangle Area to work together to provide data from areas beyond contract areas
- Establish steering committee, liaison office and working group to coordinate the development of the REMP program
- Adopt an international partnership to promote the REMP development and exert funding and supports of the scientific community

# Roadmap and Cooperation




Maps from ISA


Current International partnership




Cable


Commercial fishing activity

www.globalfishingwatch.org

# COMRA's Position on REMPs

- ISA is the leader for development and implementation of REMP
- COMRA is indeed to strike for a **balanced resource development with conservation**
- COMRA strongly supports ISA's effort in developing REMP network for the Area and took an initiative in REMPs development in **Triangle Area** for CRFC in seamounts
- COMRA suggests to take a corporative, inclusive **all stakeholders/holistic approach** in developing REMPs
- COMRA supported the idea of developing REMPs for PMS in the Indian Ocean as well as the South Atlantic Ocean

SG of ISA
Mr. Michael Lodge

SG of COMRA
Mr. Liu Feng

Shared Benefits

Extensive Consultation

Joint Contribution

# Thank you!