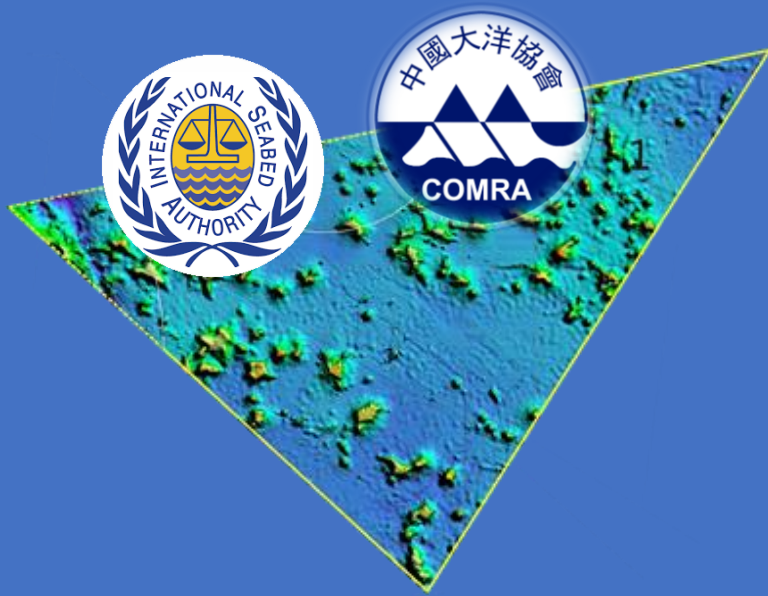




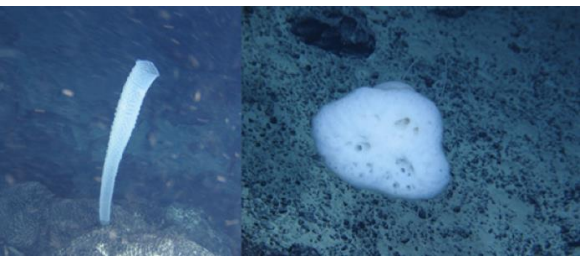
Development of
REMP for the Cobalt-Rich Ferromanganese Crusts in
Triangle Area in the Northwest Pacific Ocean
—— **Outcomes of the Qingdao Workshop**

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





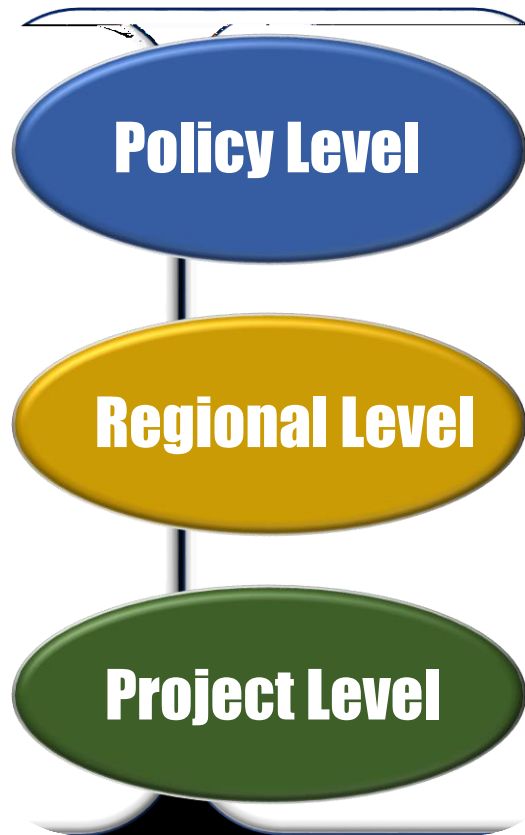
SIO **Background**

SIO **Preliminary Thinking**

SIO **Outcomes and Next Step**



Objective of Regional Environmental Management Plan

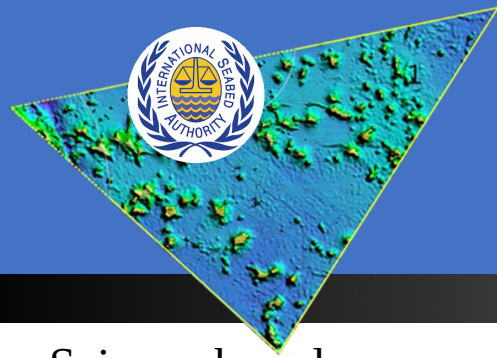


Hierarchy of EMP levels
--ISA TS No. 18

The objective of REMP (ISBA/24/C/3)

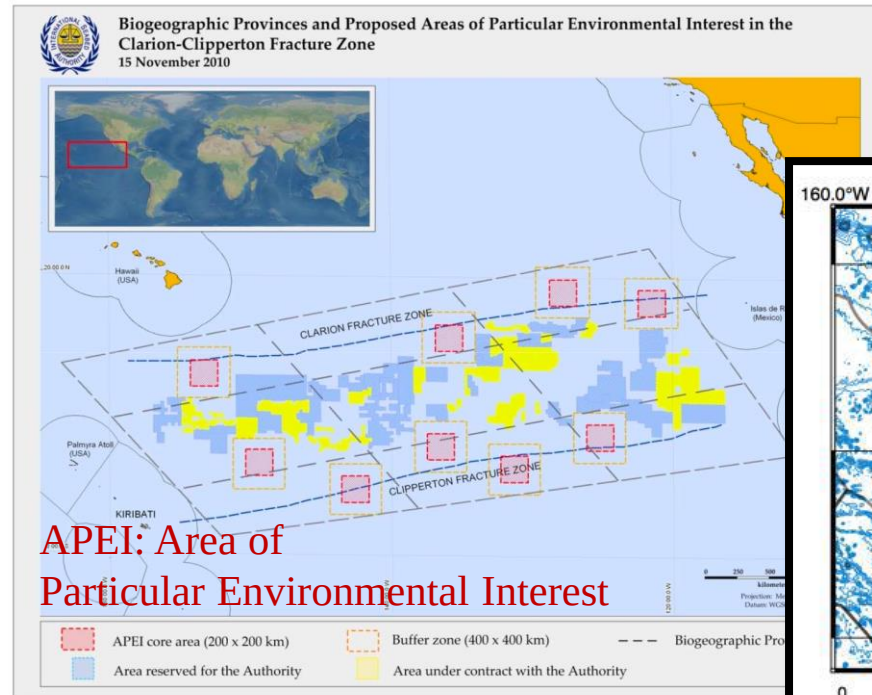
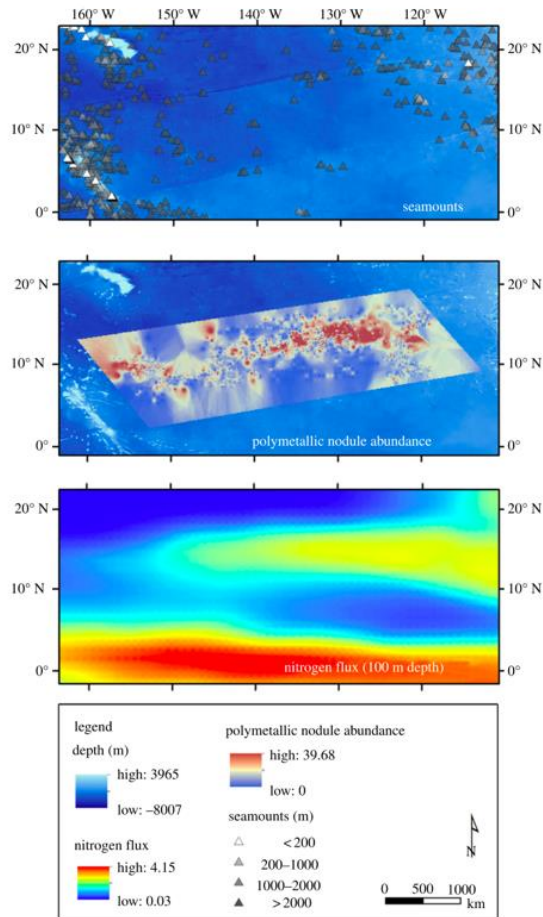
to provide the relevant organs of the Authority, as well as contractors and their sponsoring States, with **a proactive area-based management tool** to support informed decision-making that **balances resource development with conservation**.

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**.

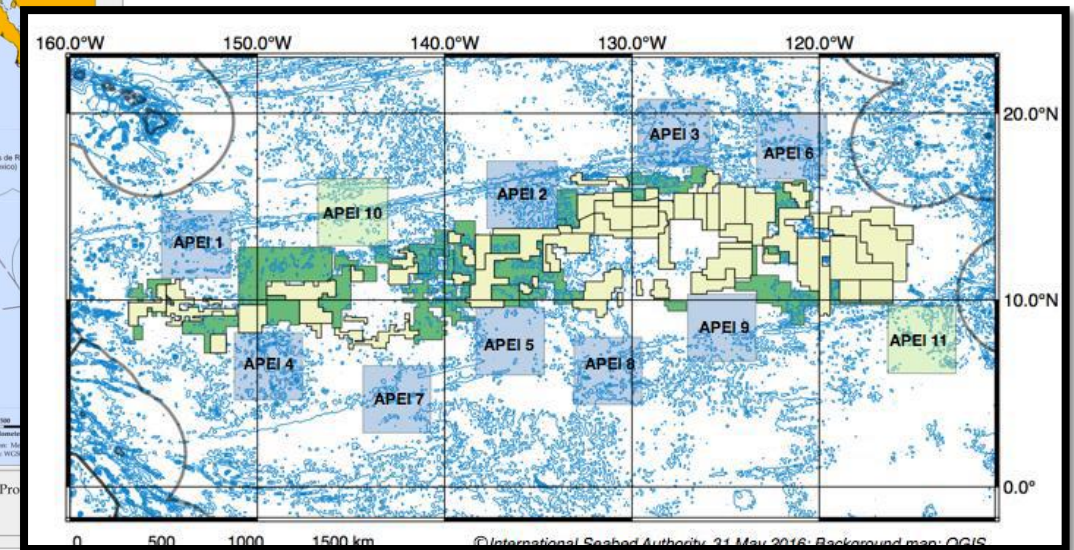


Clarion-Clipperton Zone REMP

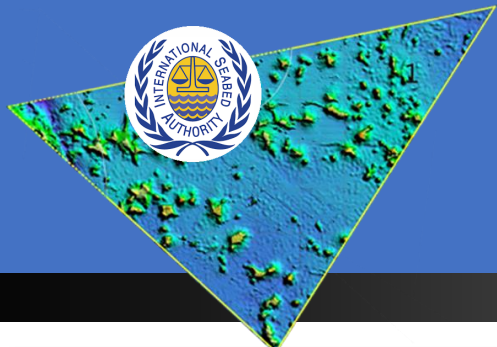
Science-based recommendations



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

United Nations **A/RES/68/70** A/RES/68/70

 **General Assembly**

Sixty-eighth session
Agenda item 76 (a)

Resolution adopted by the General Assembly on 9 December 2013

[without reference to a Main Committee (A/68/L.18 and Add.1)]

68/70. Oceans and the law of the sea

The General Assembly,

Recalling its annual resolutions on the law of the sea and on the law of the sea, including resolution 67/78 of 11 December 2012, and resolutions concerning the United Nations Convention on the Law of the Sea (Convention),

United Nations **A/RES/69/245*** A/R

 **General Assembly**

Sixty-ninth session
Agenda item 74 (a)

Resolution adopted by the General Assembly on 29 December 2014

[without reference to a Main Committee (A/69/L.29 and Add.1)]

69/245. Oceans and the law of the sea

United Nations **A/RES/70/235*** A/RES/70/235*

 **General Assembly**

Seventieth session
Agenda item 79 (a)

Resolution adopted by the General Assembly on 23 December 2015

[without reference to a Main Committee (A/70/L.22 and Add.1)]

70/235. Oceans and the law of the sea

United Nations **A/RES/72/73** A/RES/72/73

 **General Assembly**

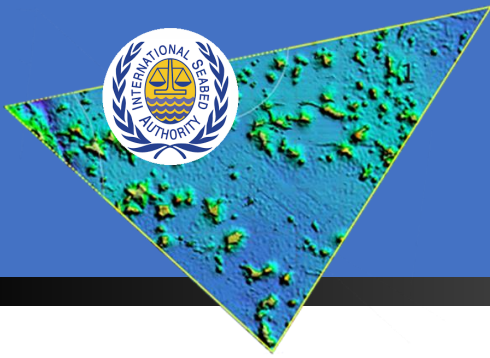
Seventy-second session
Agenda item 77 (a)

Resolution adopted by the General Assembly on 5 December 2017

Distr.: General
4 January 2018

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

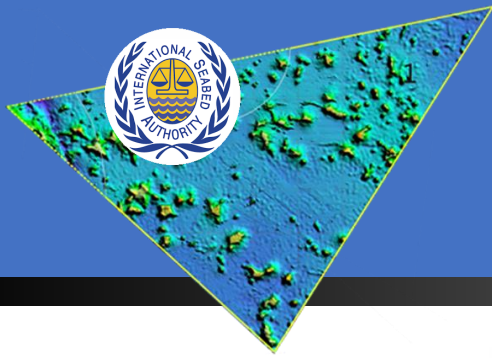


ISA Council's Documents

International Seabed Authority		ISBA/24/C/8	ISBA/24/C/8	Distr.: General 13 March 2018 Original: English
International Seabed Authority		ISBA/23/C/18	ISBA/23/C/18	Distr.: General 15 August 2017 Original: English
International Seabed Authority  Council		ISBA/22/C/28	ISBA/22/C/28	Distr.: General 19 July 2016 Original: English

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



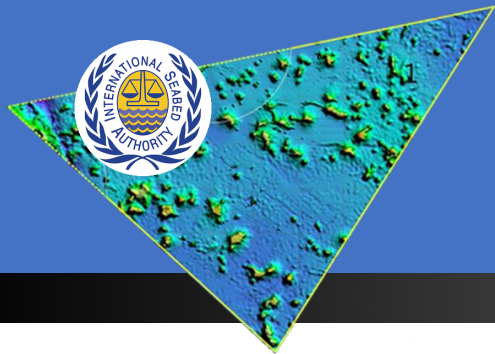
Photos in the 24th Session

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**
-

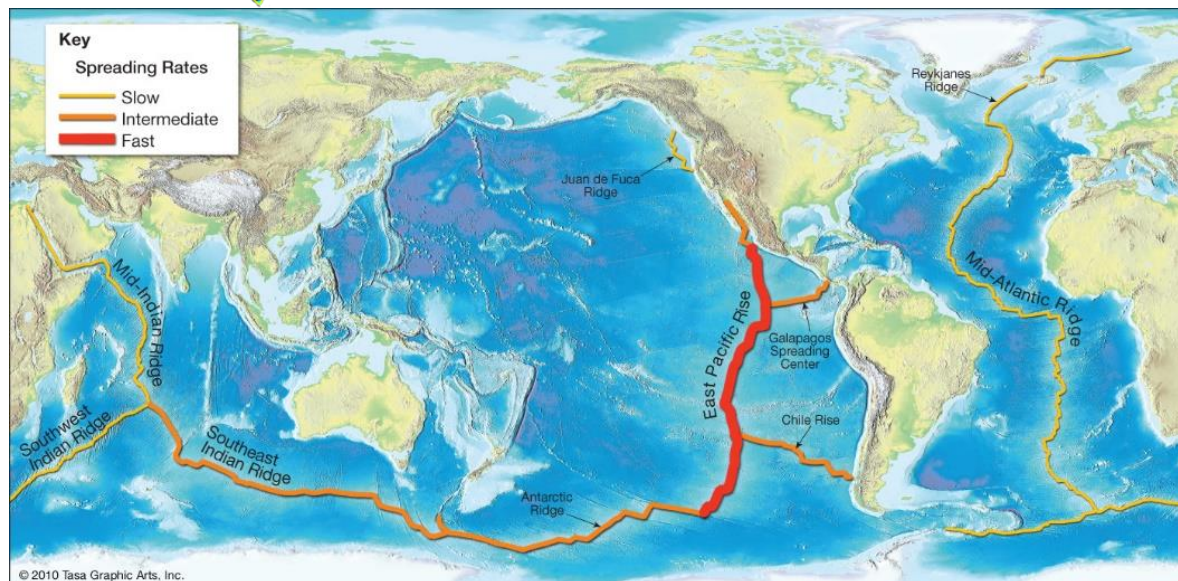


Differences among Three Resources Areas

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

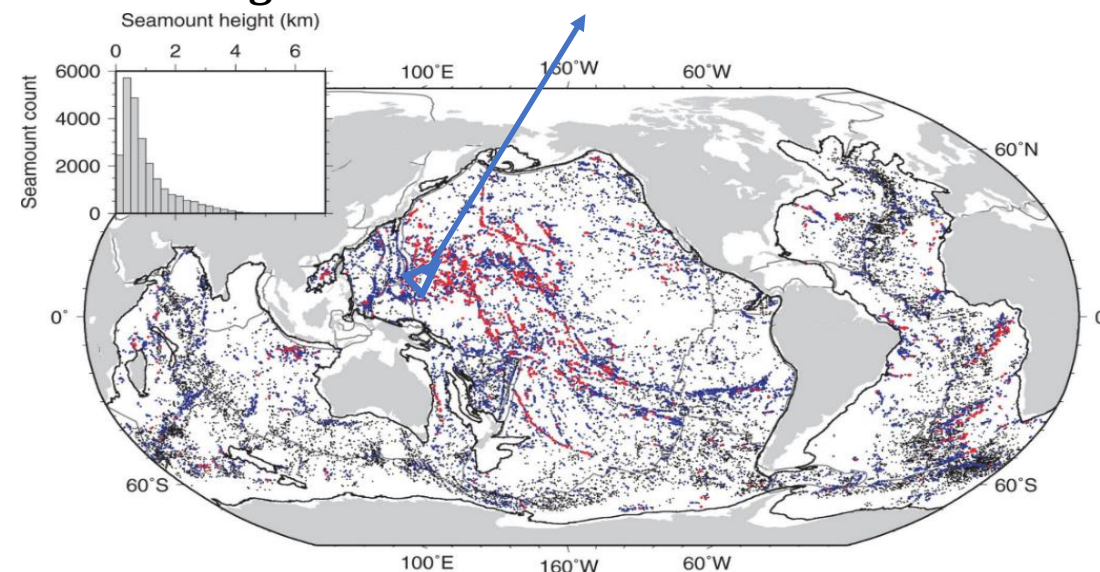
Black: $0.1 \leq h < 1$ km ($n = 16,185$)

Blue: $1 \leq h < 3$ km ($n = 7514$)

Red: $h \geq 3$ km ($n = 944$)

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

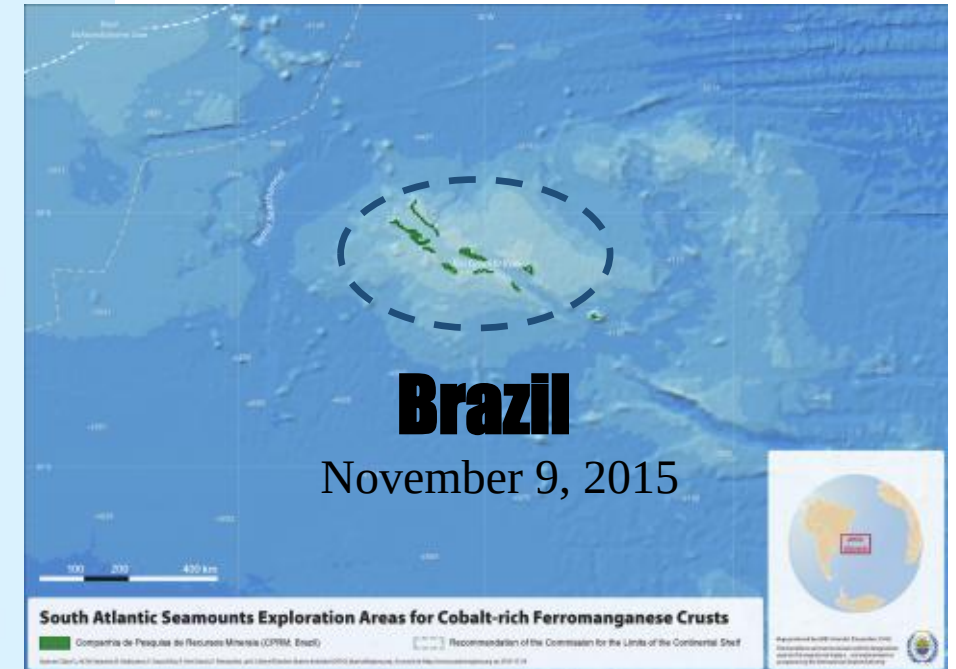
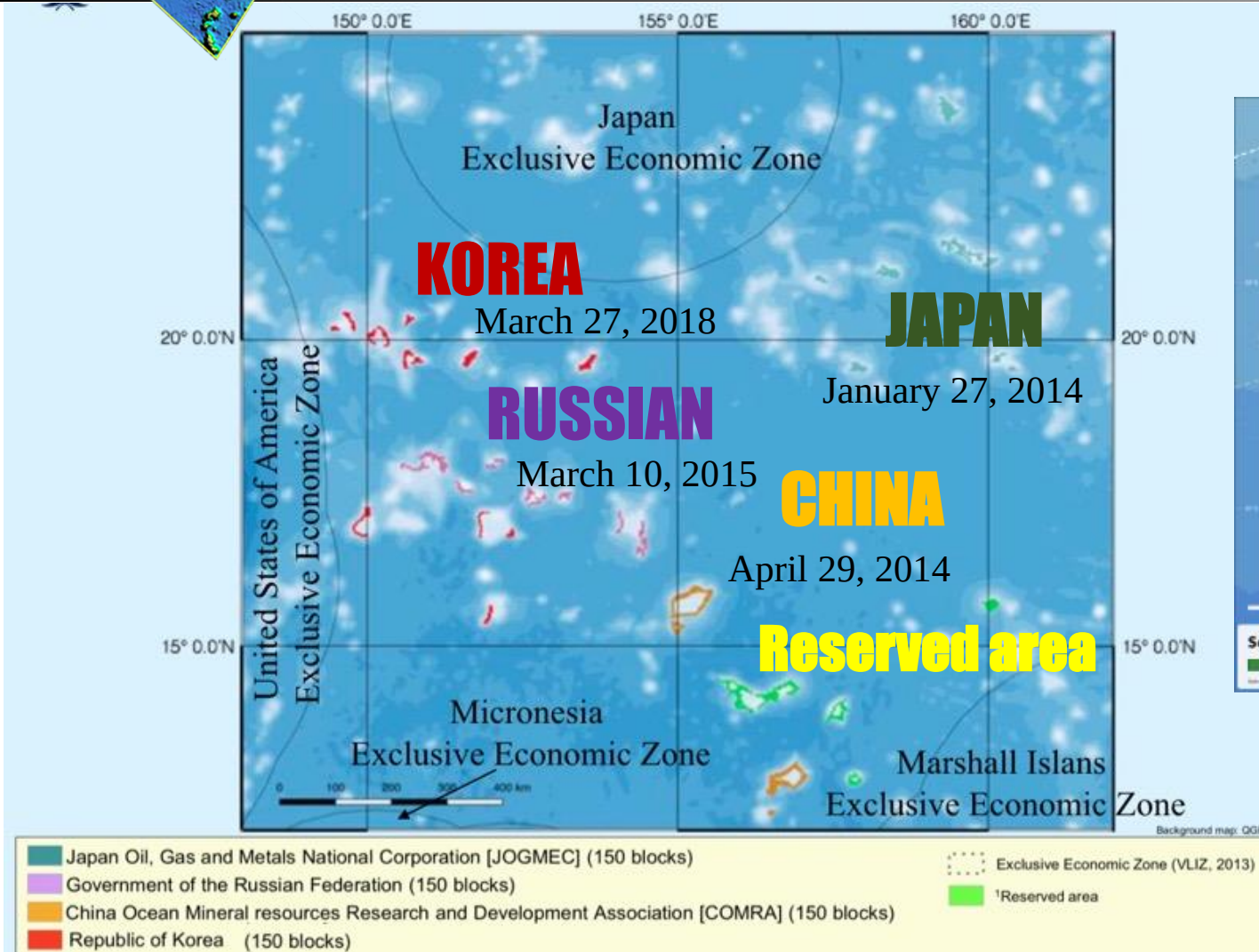
Triangle Area in the northwest Pacific Ocean



Map from Kim & Wessel (2011) Geophys J Int



Contract for Cobalt-rich Ferromanganese Crusts



South Atlantic Ocean

Map from ISA

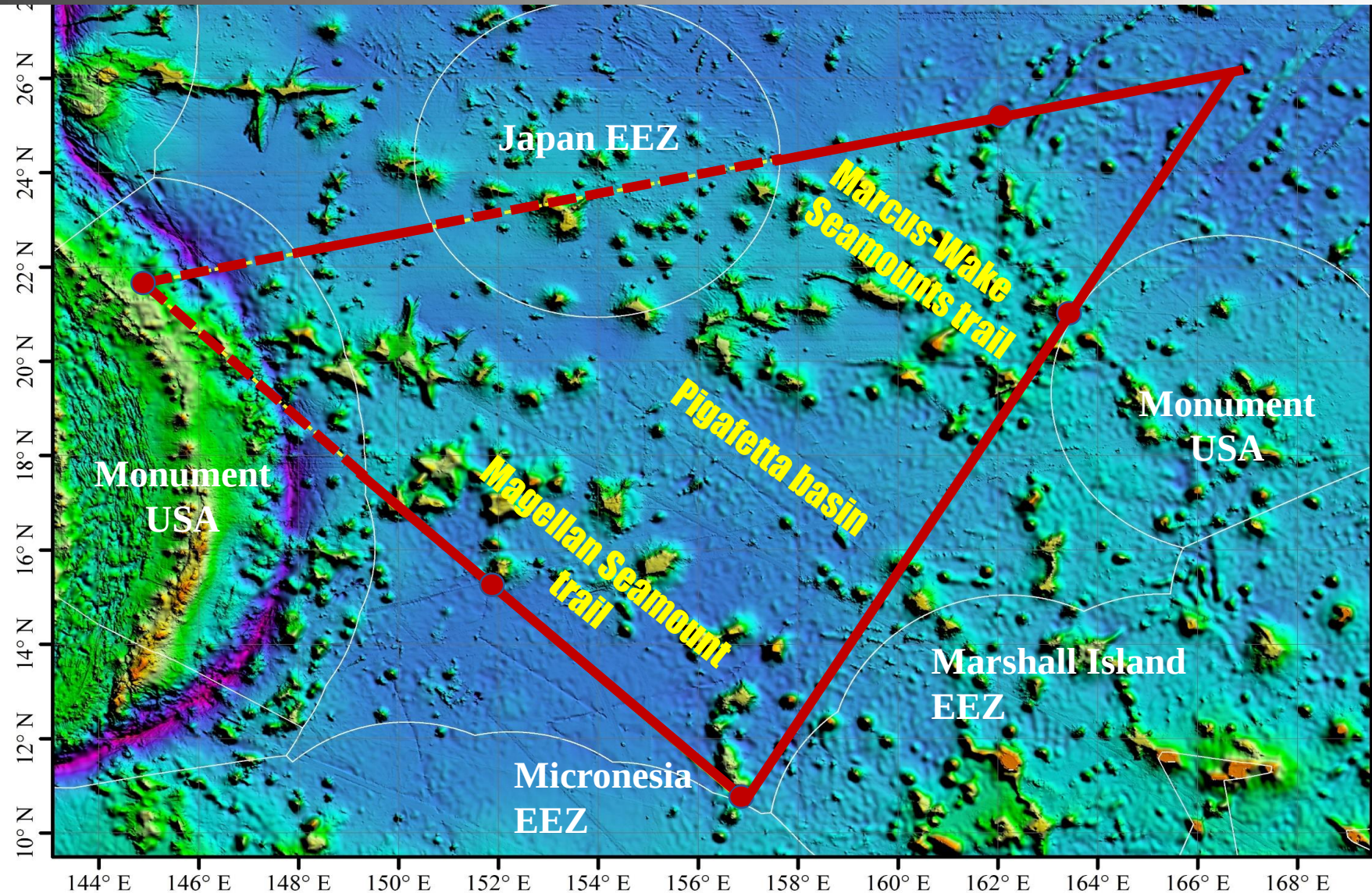


Triangle Area within the Northwest Pacific Ocean

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

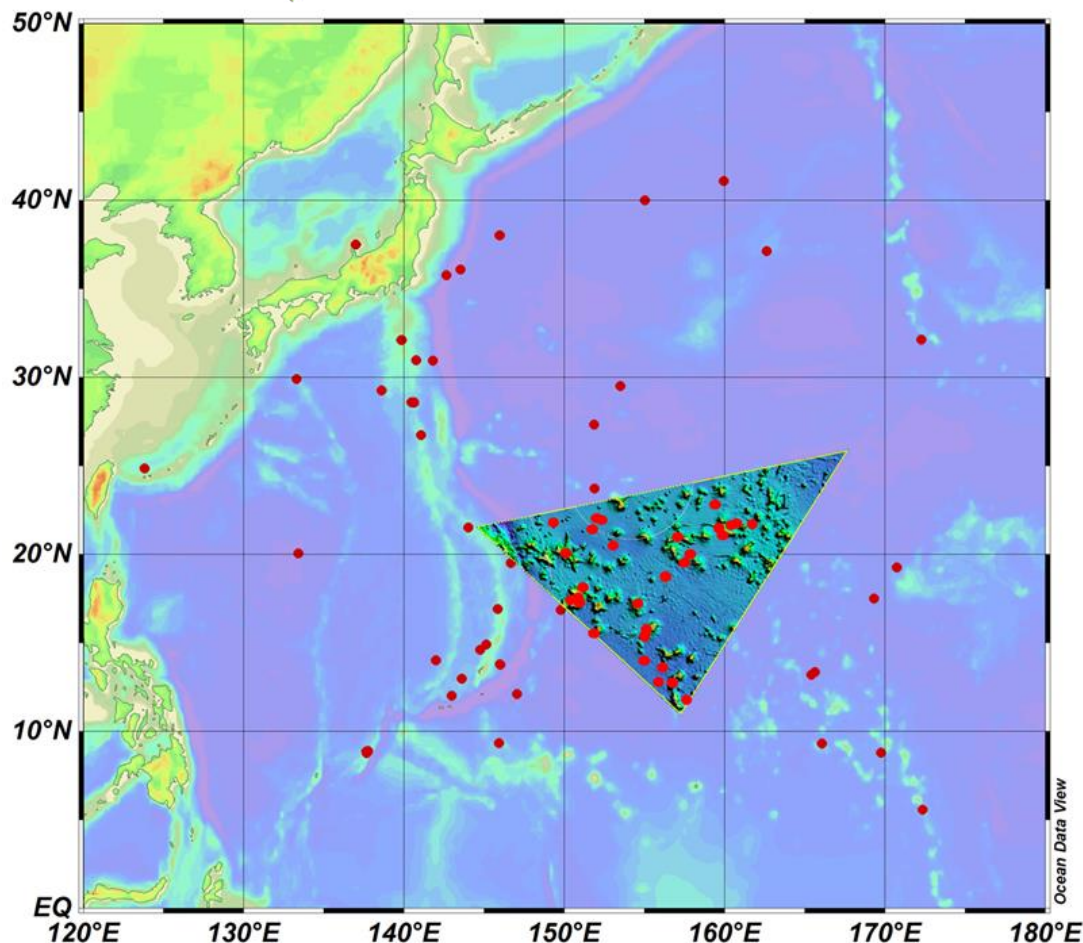
Ave. depth of top: 1524 m (n=38)
Ave. altitude: 3578 m (n=38)

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

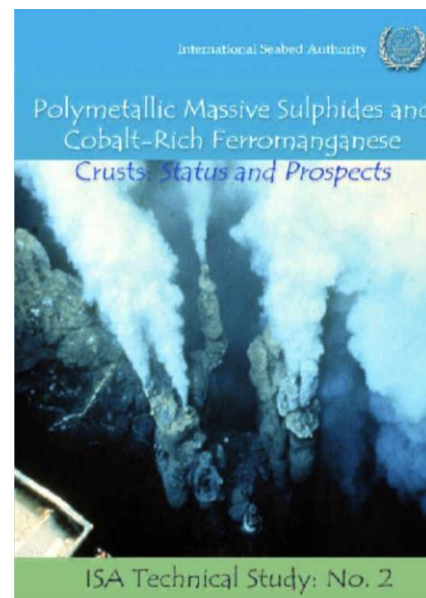
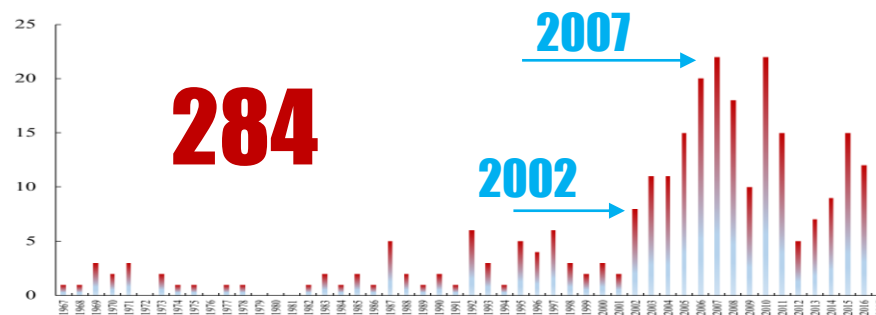




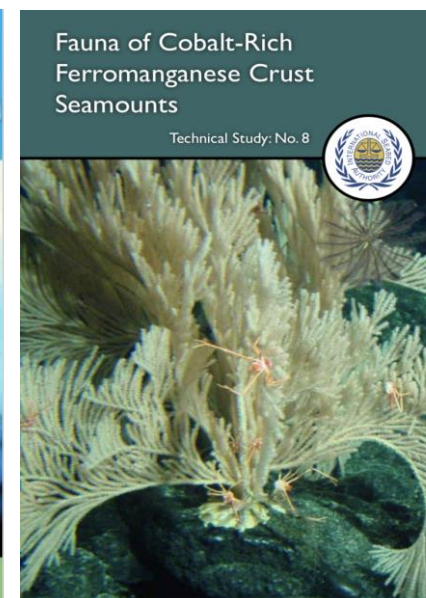
Current Knowledge



Publications regarding the northwest Pacific



ISA Technical Study



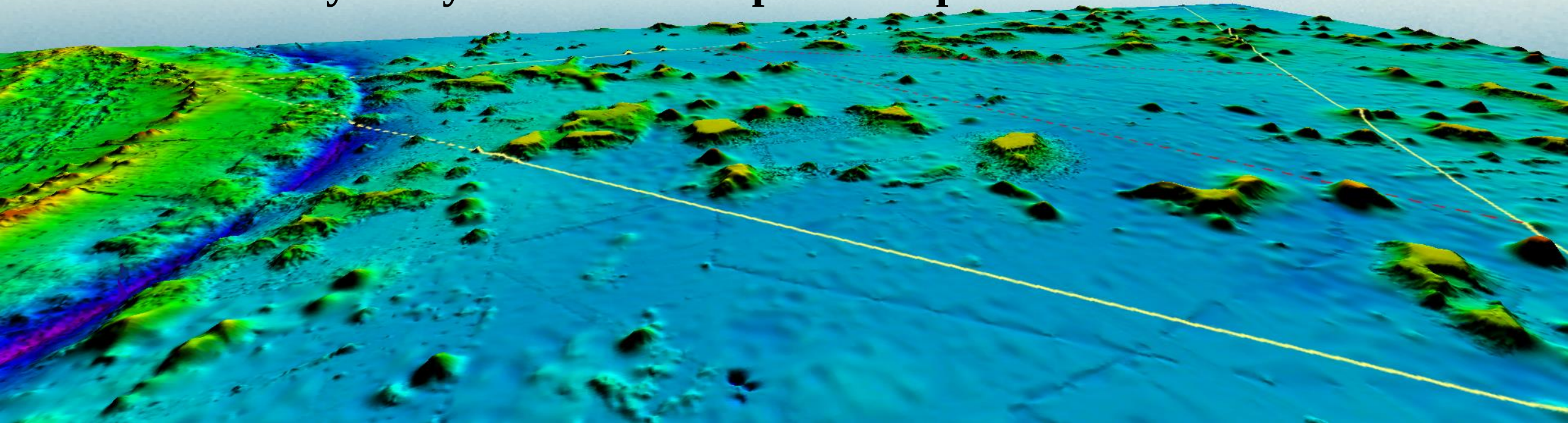
Workshops





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

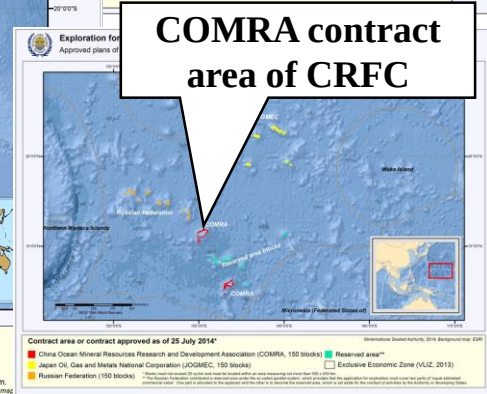
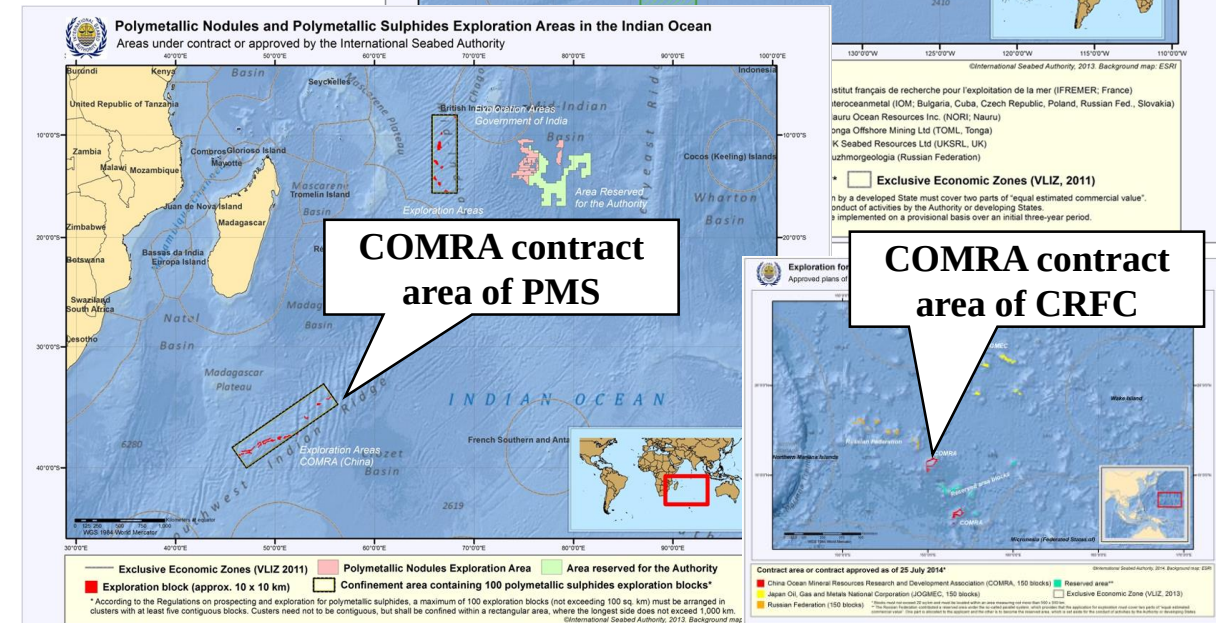
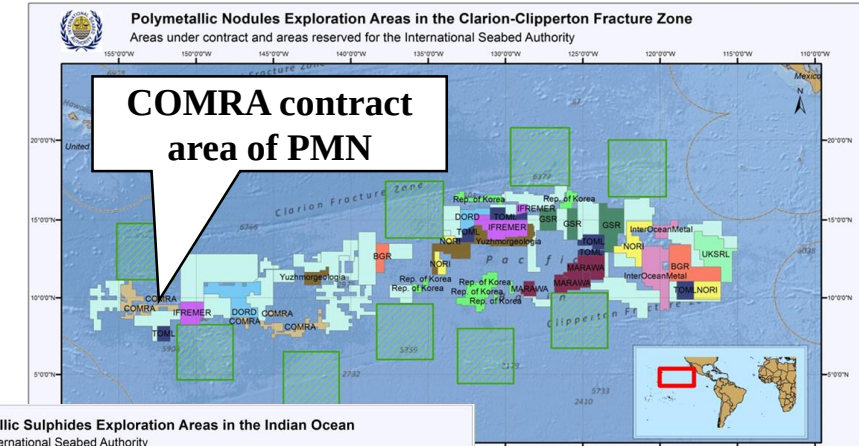
Three main purposes

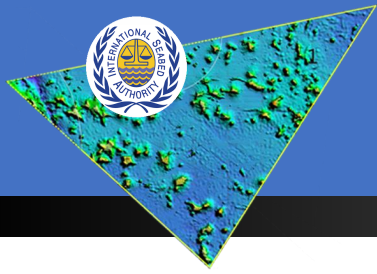
- to explore new resources and promote the establishment of a deep sea industry
- to increase cognition of the deep sea environment and development of the sea technology & equipment
- to participate in the regime development of the Area for the peaceful utilization

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

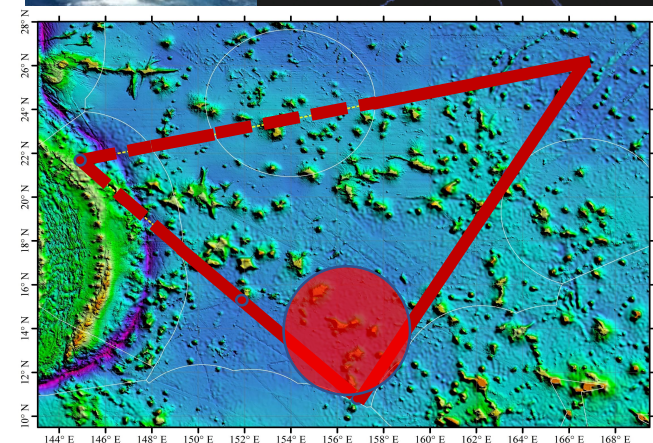
Three contract areas

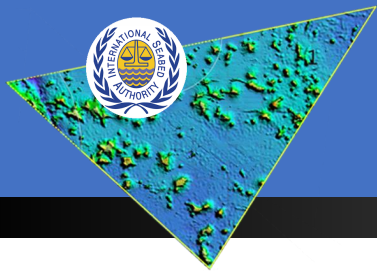




COMRA Surveys in Triangle Area

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





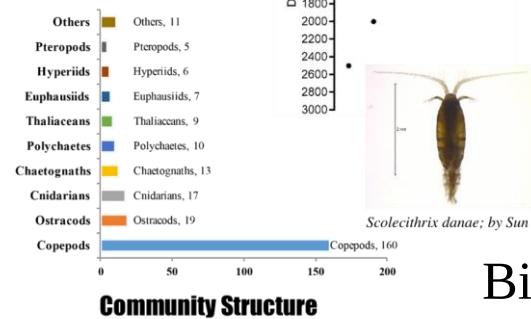
COMRA Surveys in Triangle Area

Scatter diagram

Chemical oceanography

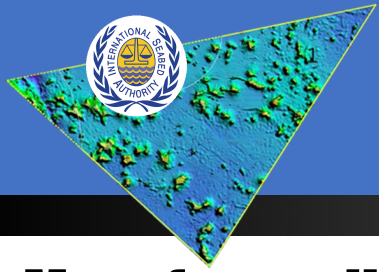
Biodiversity

- 10 groups
- 257 species
- 62% Copepods



Physical oceanography

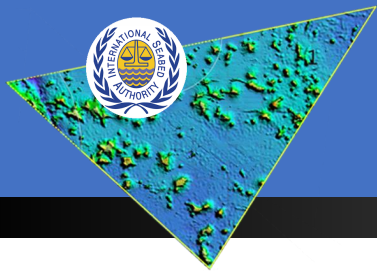
Biology



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.



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

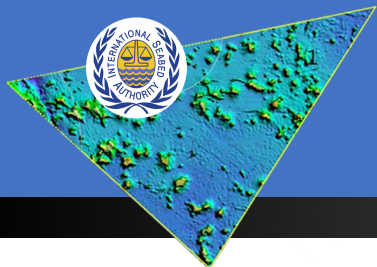


Hosted by



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

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Science & Technology
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Hong Kong University of
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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.

Opening Remark

Convened by



Ministry of Natural Resources

Convened by



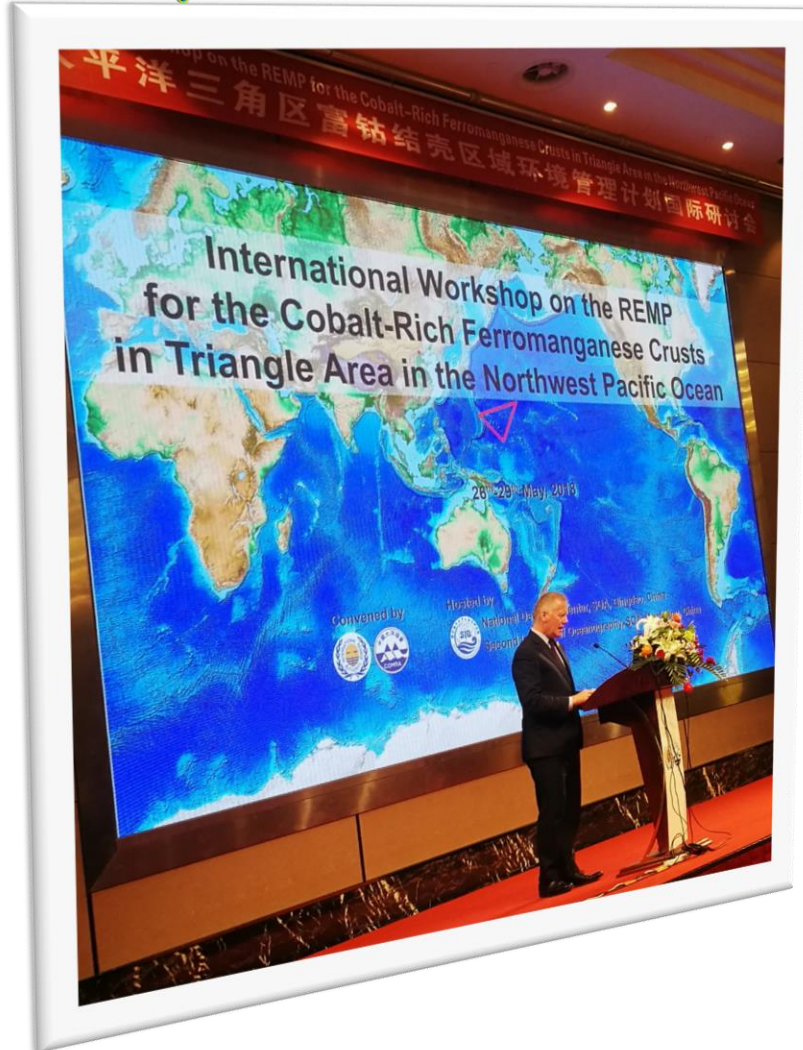
ISA

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

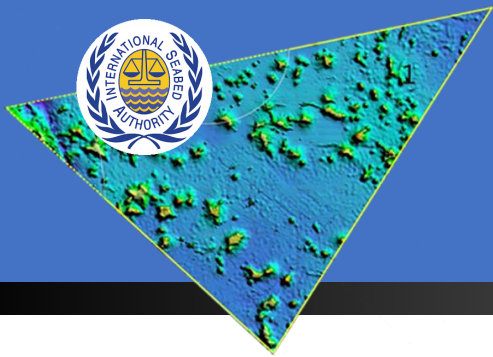


I would like to **highlight** three points:

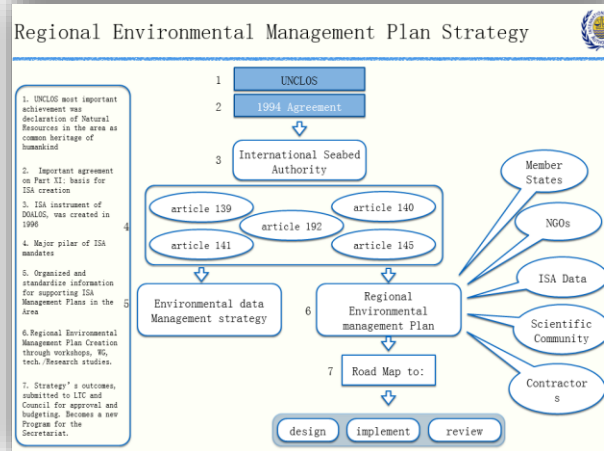
First, in designing a REMP for the Triangle area, many lessons might be drawn from the existing CCZ-REMP, including the guiding principles, implementation methodology, design principles for APEIs, etc.

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.



Deep sea environmental policy & Deep sea environmental practice





Invited Presentations

Session 1 Legal Framework



Yonosheng Cai



Cindy Lee Van Dover

Session 3 REMP Proposal and Perspective



Xue-Wei Xu



Sander Mulrow

Session 2 CFC Habitat



Tina Molodtsova



**Tomohiko
Fukushima**



Chunsheng Wang



Se-Jong Ju



Viacheslav Melnik



Akira Iguchi



Working Groups



Report on WG1



Report on WG2



Report on WG3





Other Activities





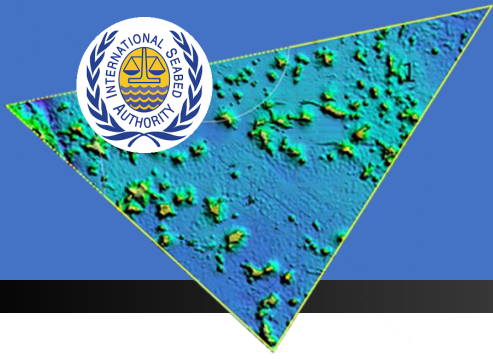
Main Conclusions / Recommendations by WG1

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



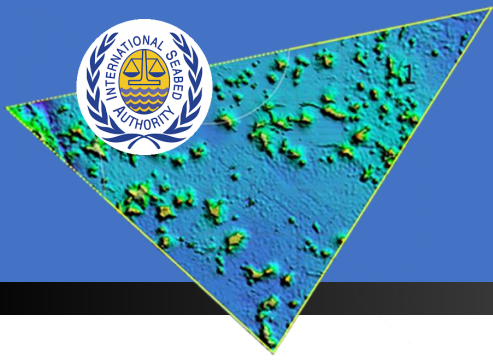
Main Conclusions / Recommendations by WG2

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 fit 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

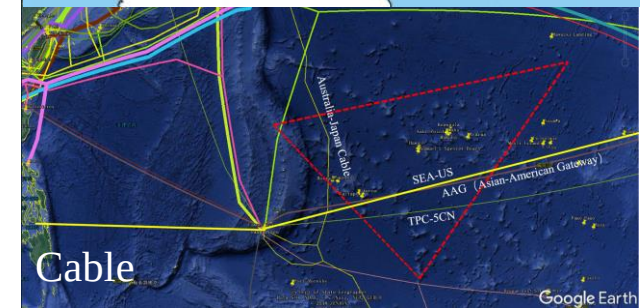
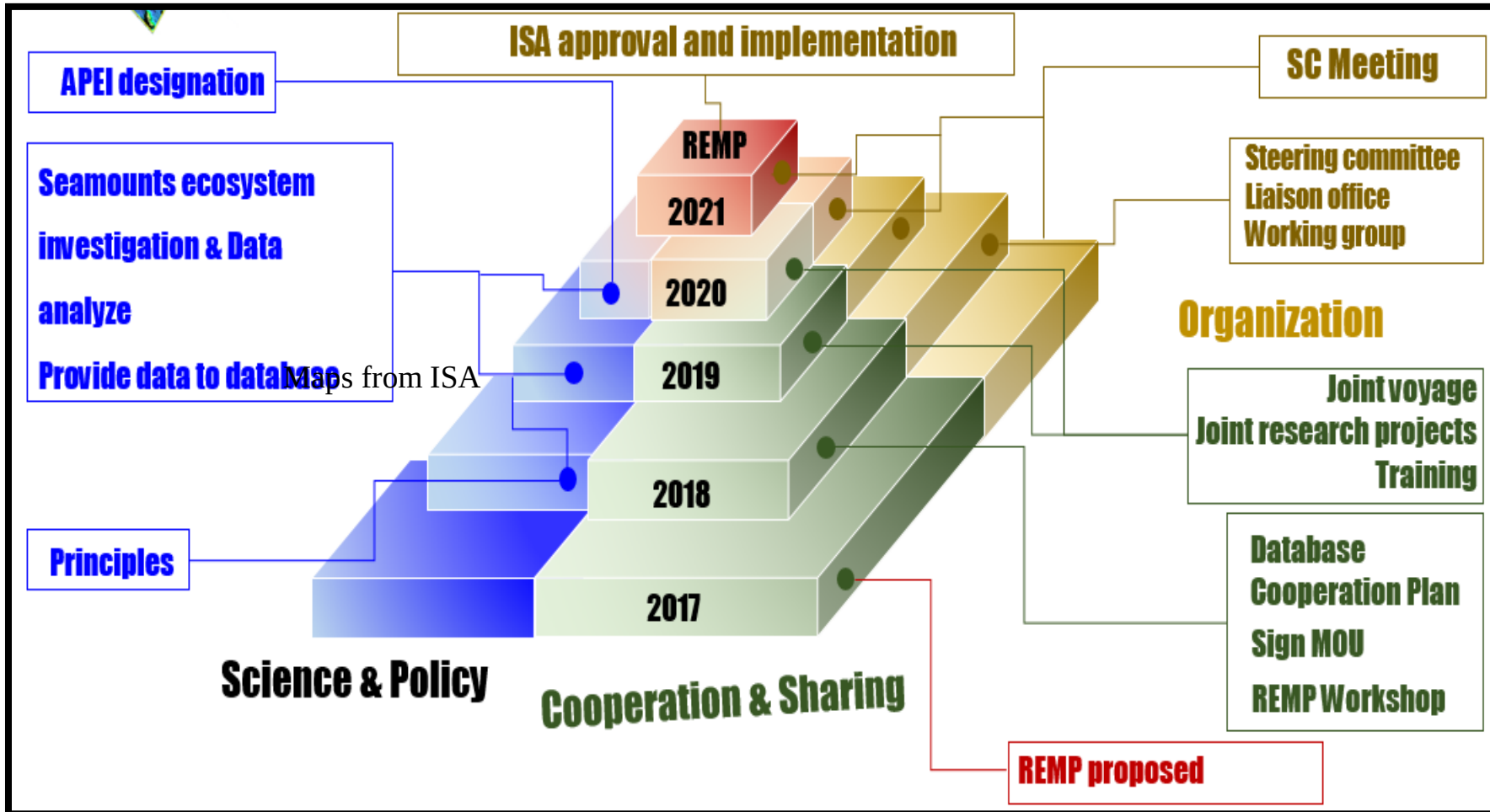
- SIO Data sharing should be realized as soon as possible to promote the development of the REMP; Scope and time limits of confidential data should be defined
- SIO The ISA, contractors, and other organizations should carry out a variety of cooperation and communications in order to discuss important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

Recommendations

- SIO 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
- SIO Establish steering committee, liaison office and working group to coordinate the development of the REMP program
- SIO Adopt an international partnership to promote the REMP development and exert funding and supports of the scientific community



Roadmap and Cooperation





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

**Extensive
Consultation**

Shared Benefits



Joint Contribution

Thank you!

