

Protecting deep sea hydrothermal vent biodiversity through ABMTs

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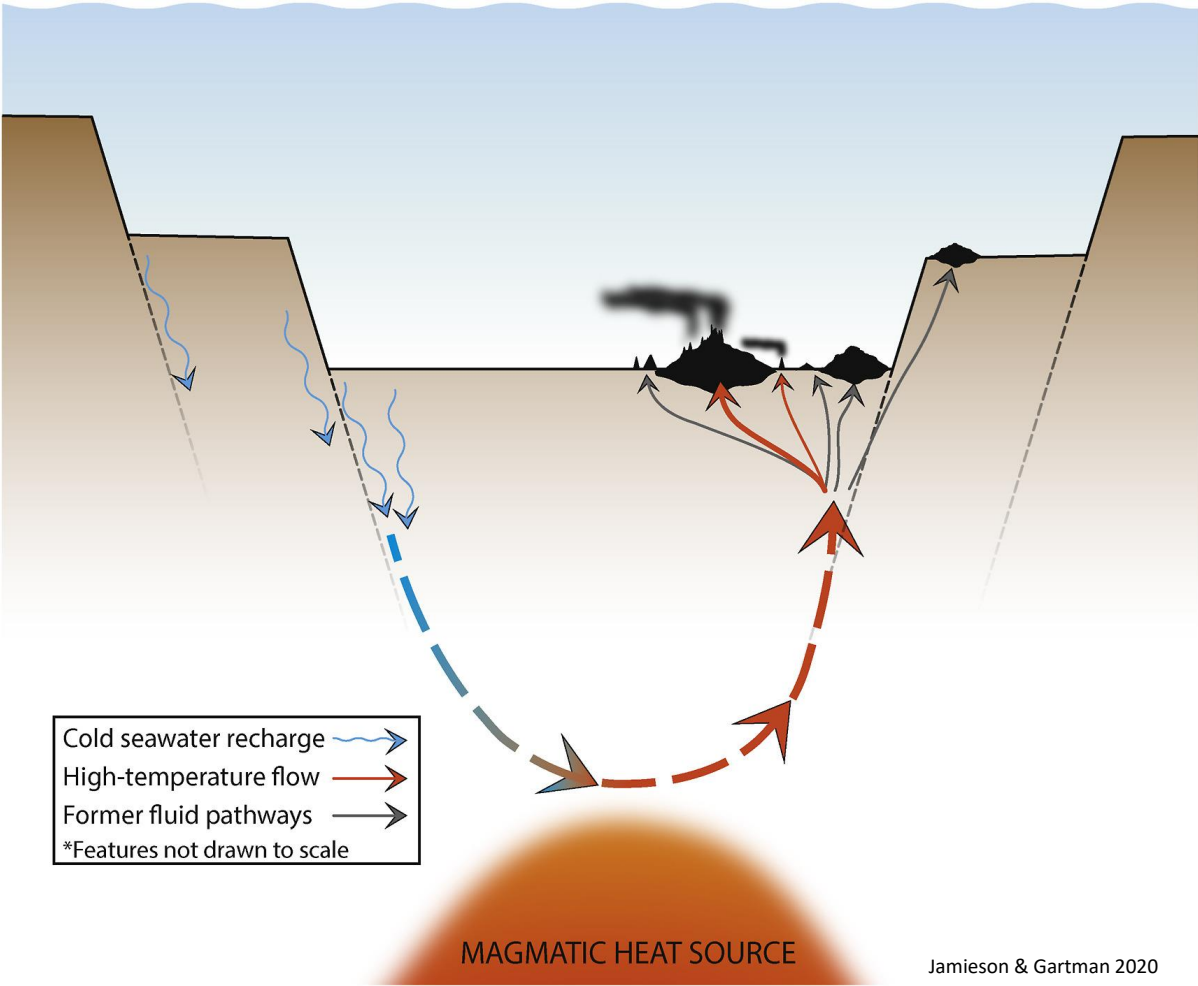


Royal Netherlands Institute
for Sea Research

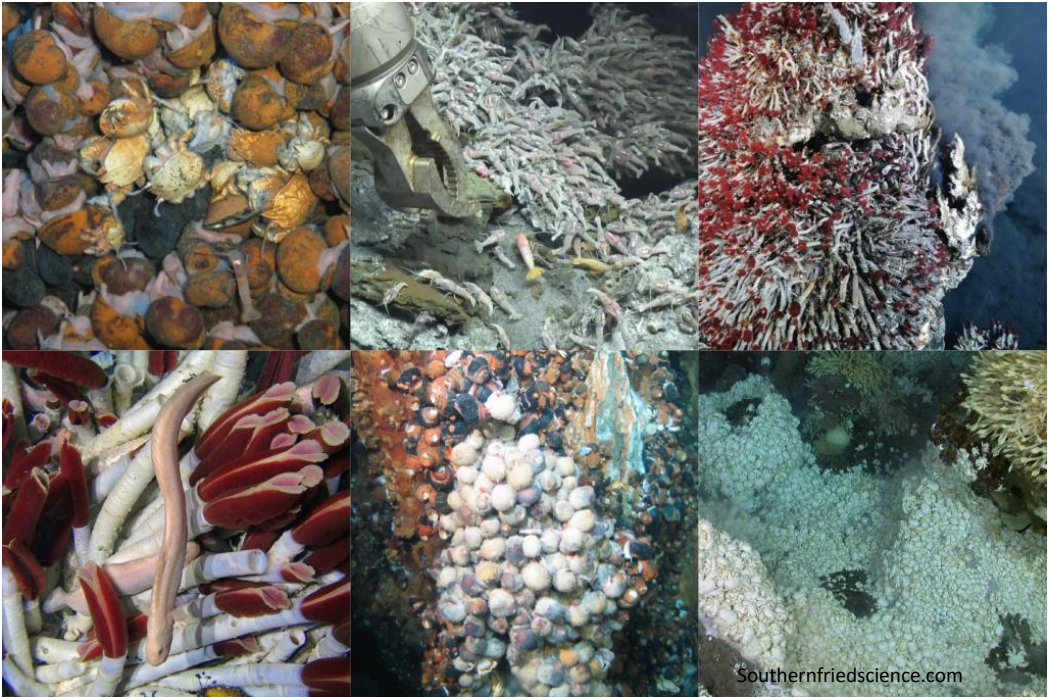


Utrecht University

Hydrothermal vents



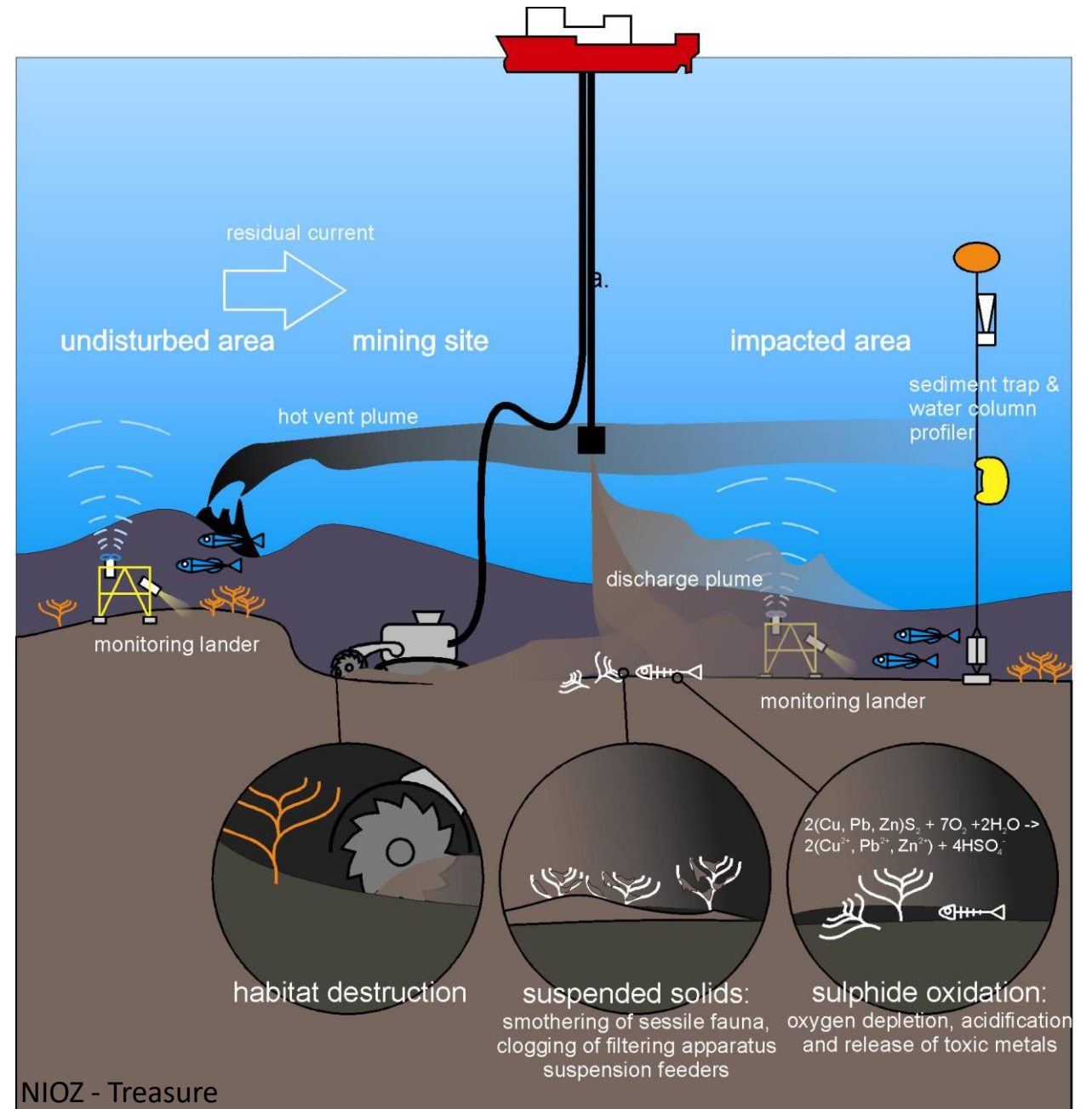
Jamieson & Gartman 2020



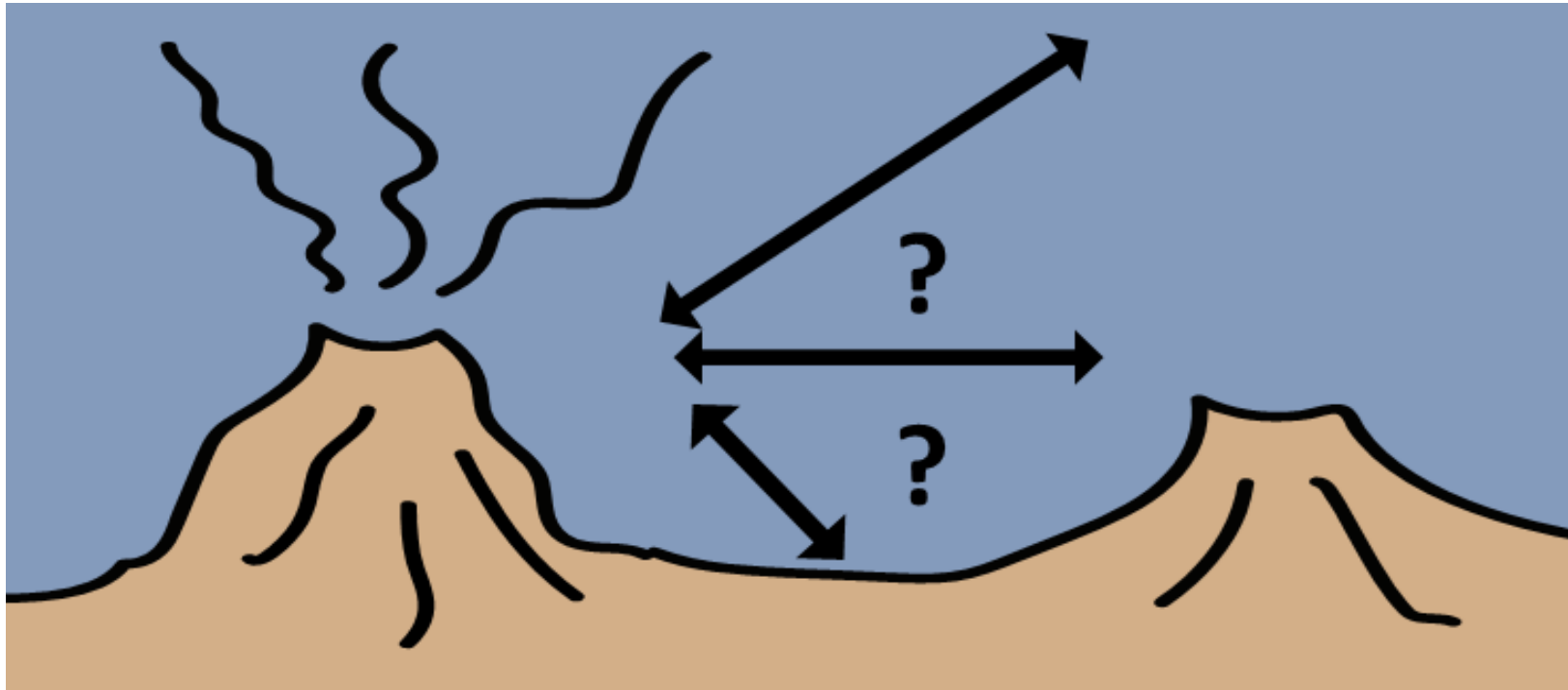
Southernfriedscience.com

Deep-sea mining

- Habitat destruction
- Plume smothering



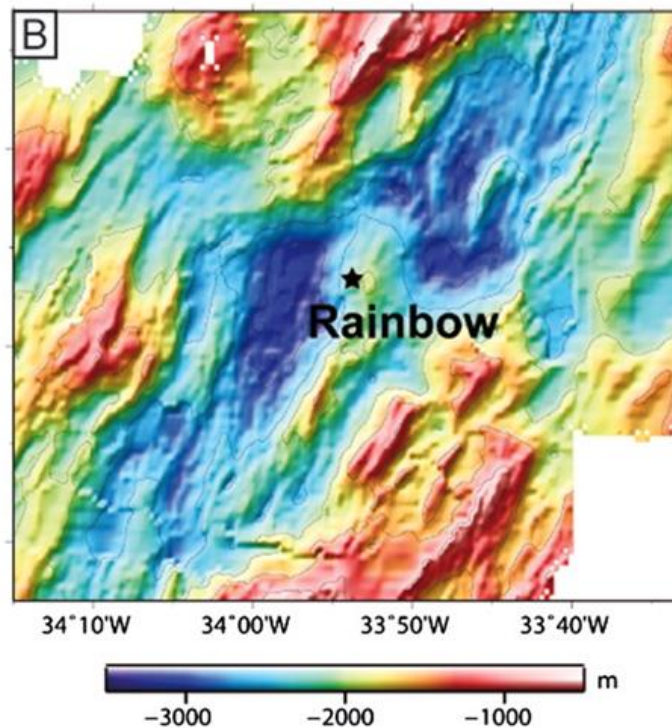
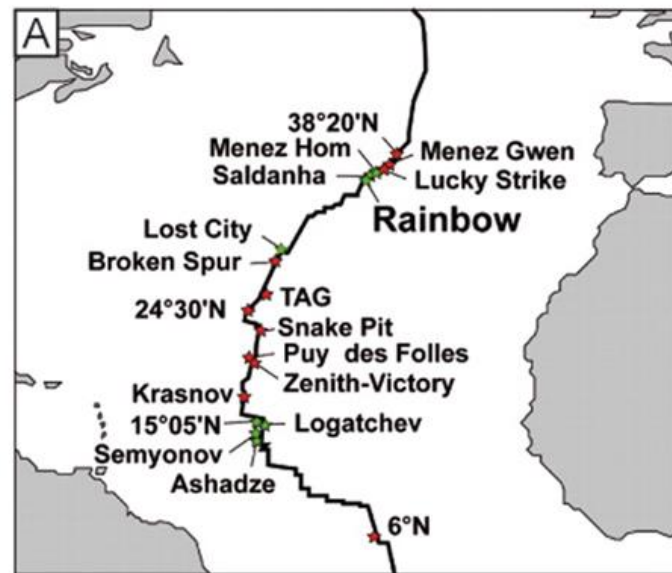
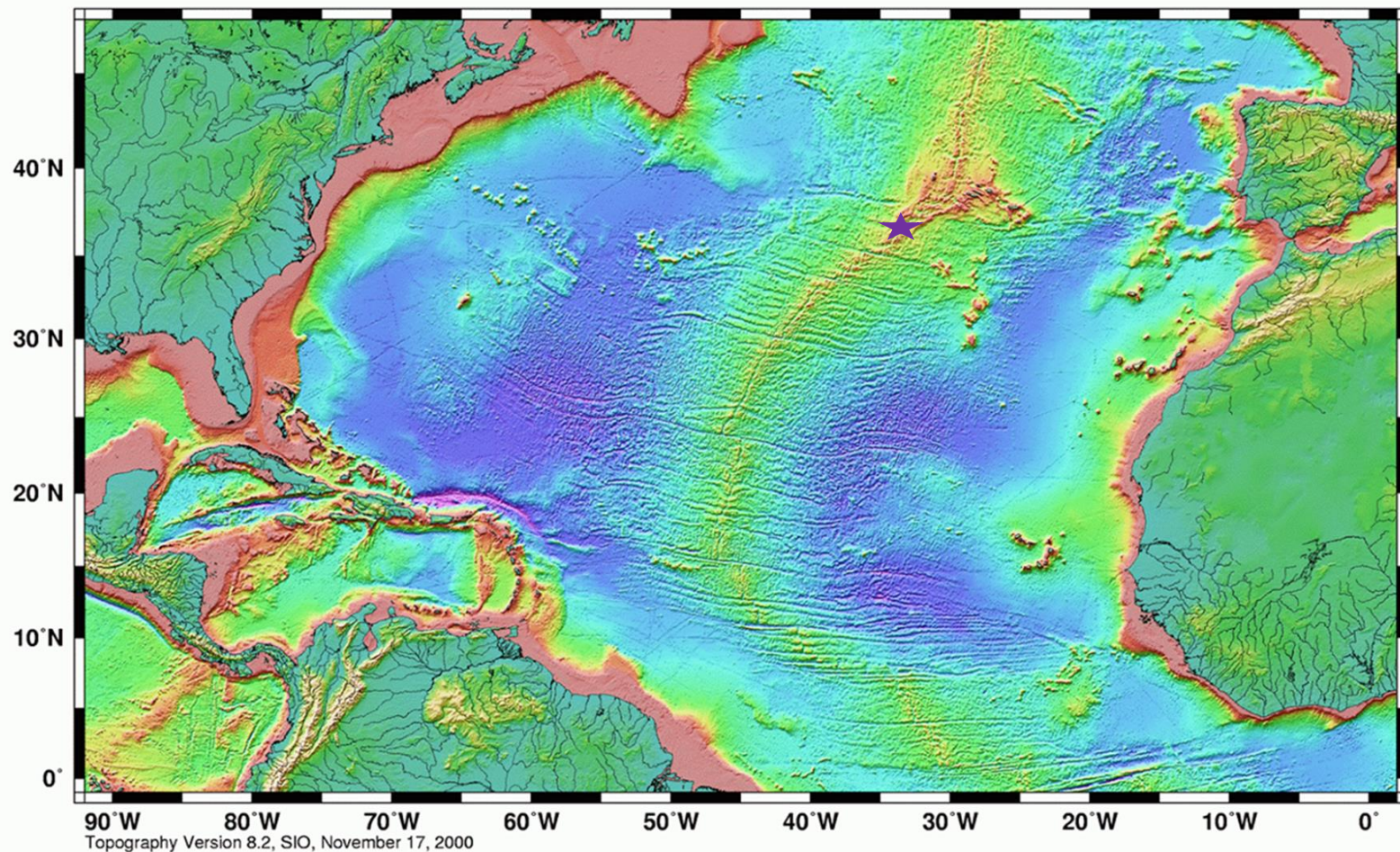
Hydrothermal vent biological connectivity



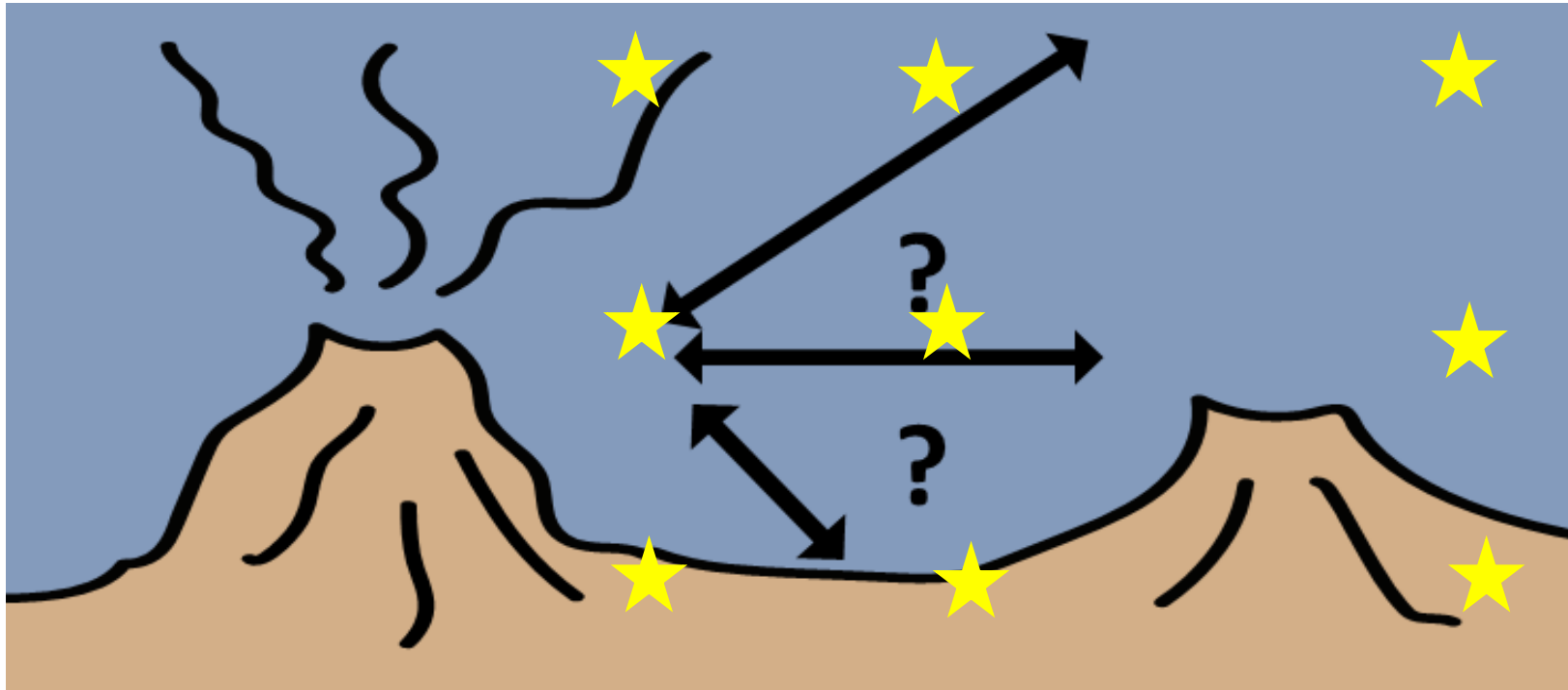
Connectivity in 3D

- spread over seabed and through water column

Rainbow hydrothermal vent



Hydrothermal vent connectivity



Sampling at & around vent site

- look for changes in biodiversity
- trace vent-endemic species



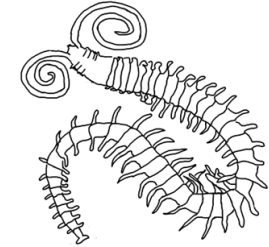
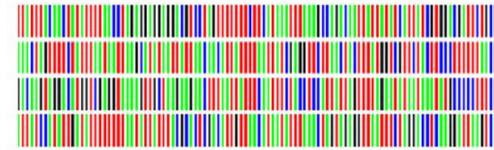
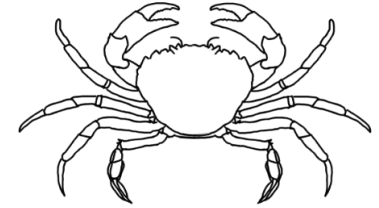
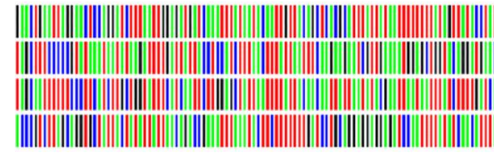
Sediment samples

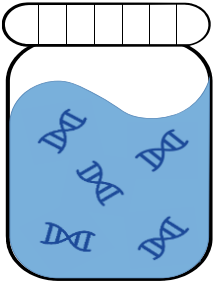

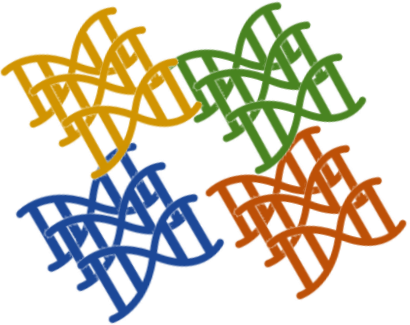
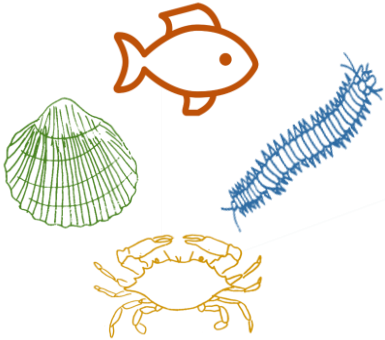


Water samples

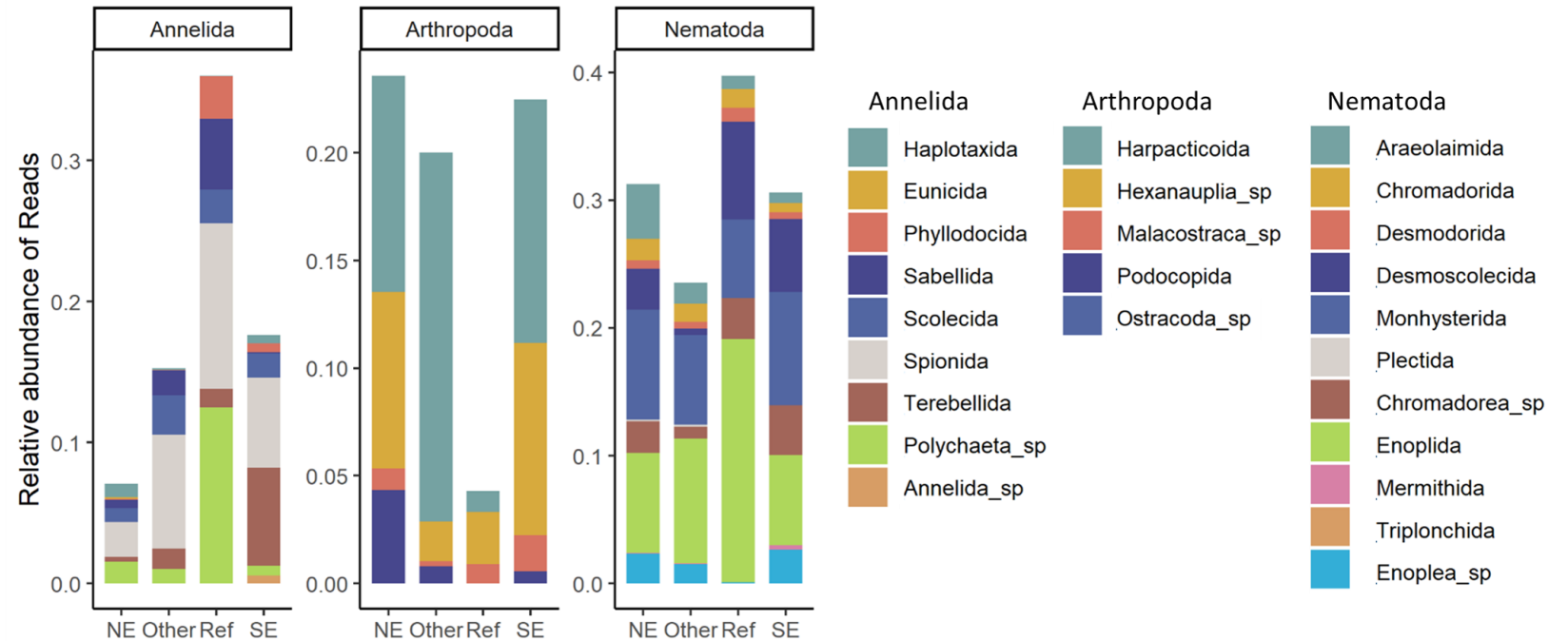
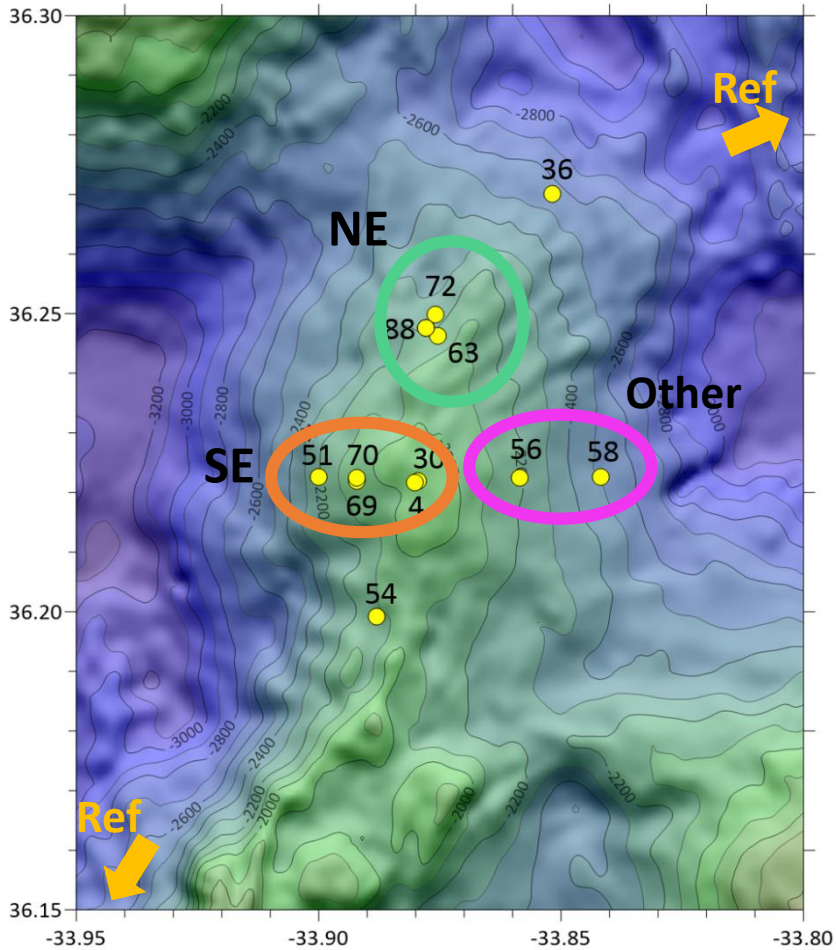
eDNA metabarcoding

DNA barcodes



Environmental sample	DNA extraction	PCR amplification	Sequencing - HTS	Identification
			<pre>CCTGCTGATCATCGATCA CCTGCTGATCATCGATCA ACTGCTGATCATCGATCA ACTGCTGATCATCGATCA ACTGCTTATCATCGACCA ACTGCTTATCATCGACCA TCAGCTGATCATCGATCA TCAGCTGATCATCGATCA ACTGCTGATCATCGATCG ACTGCTGATCATCGATCG</pre>	

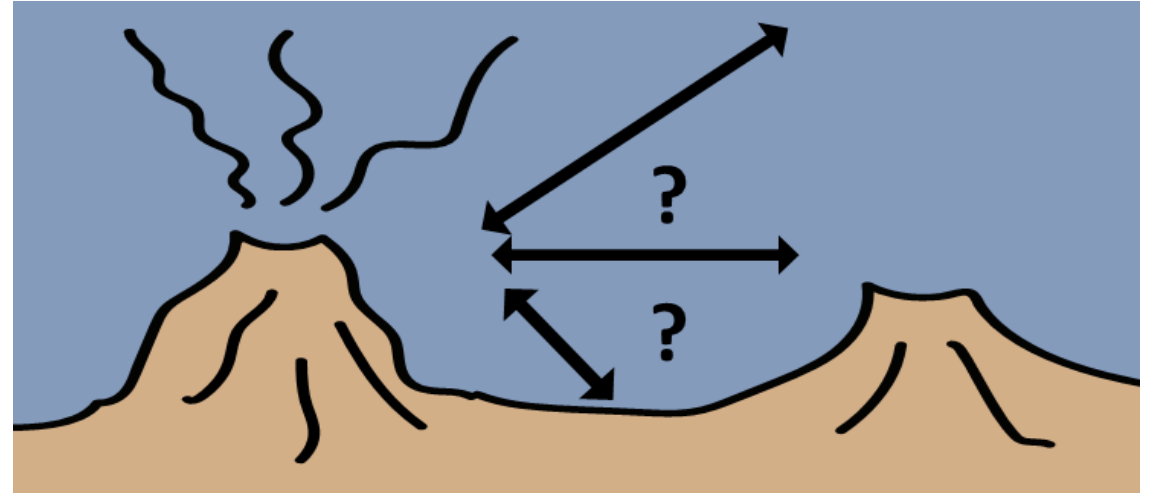
Rainbow surrounding seabed biodiversity



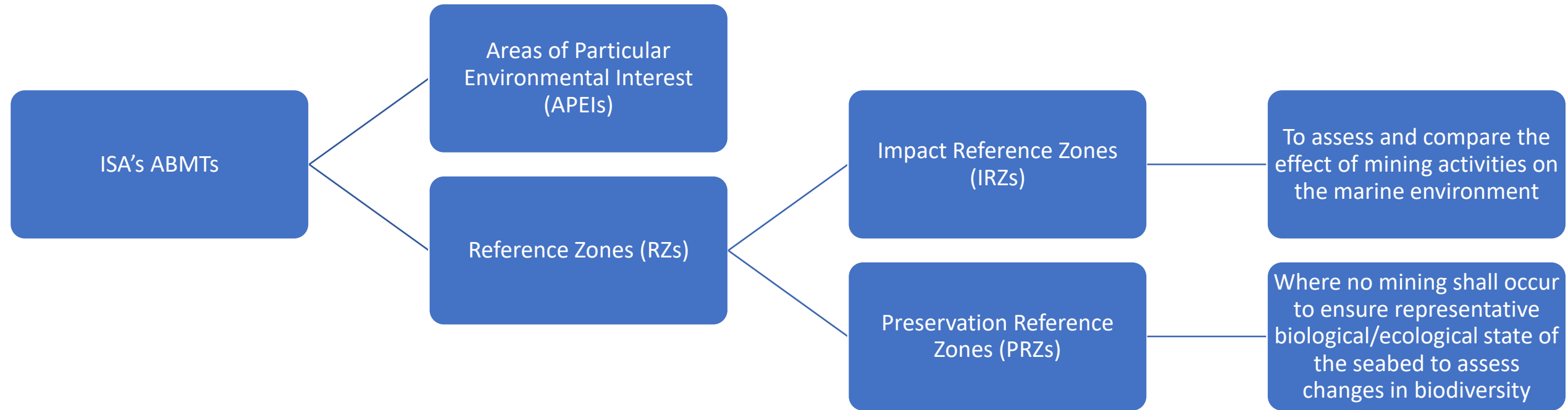
Next step: species level identification, & tracking endemic species

Expectations from sampling

- Insights in connectivity
- Insights on influence vent biodiversity on surrounding and v.v.
- Insights on vulnerable area



Area-based management tools of the International Seabed Authority



Questions to explore further...



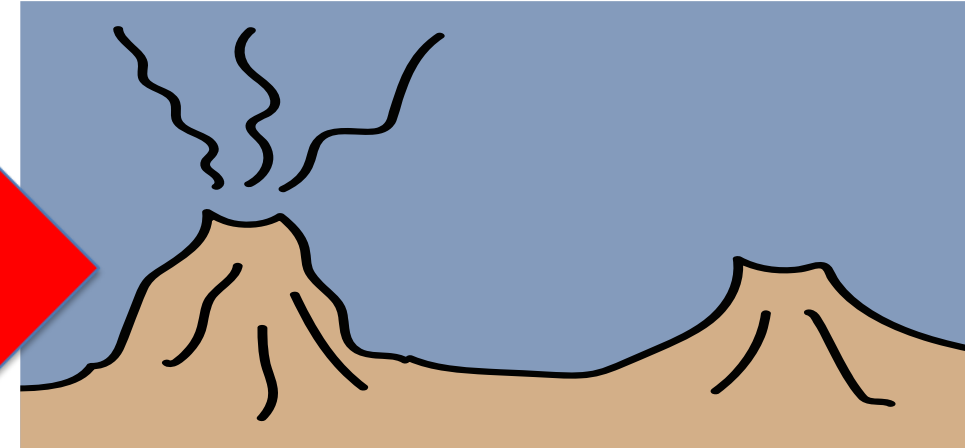
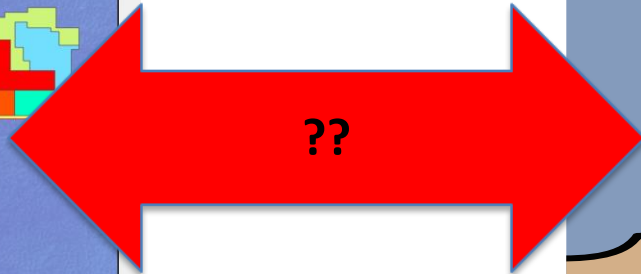
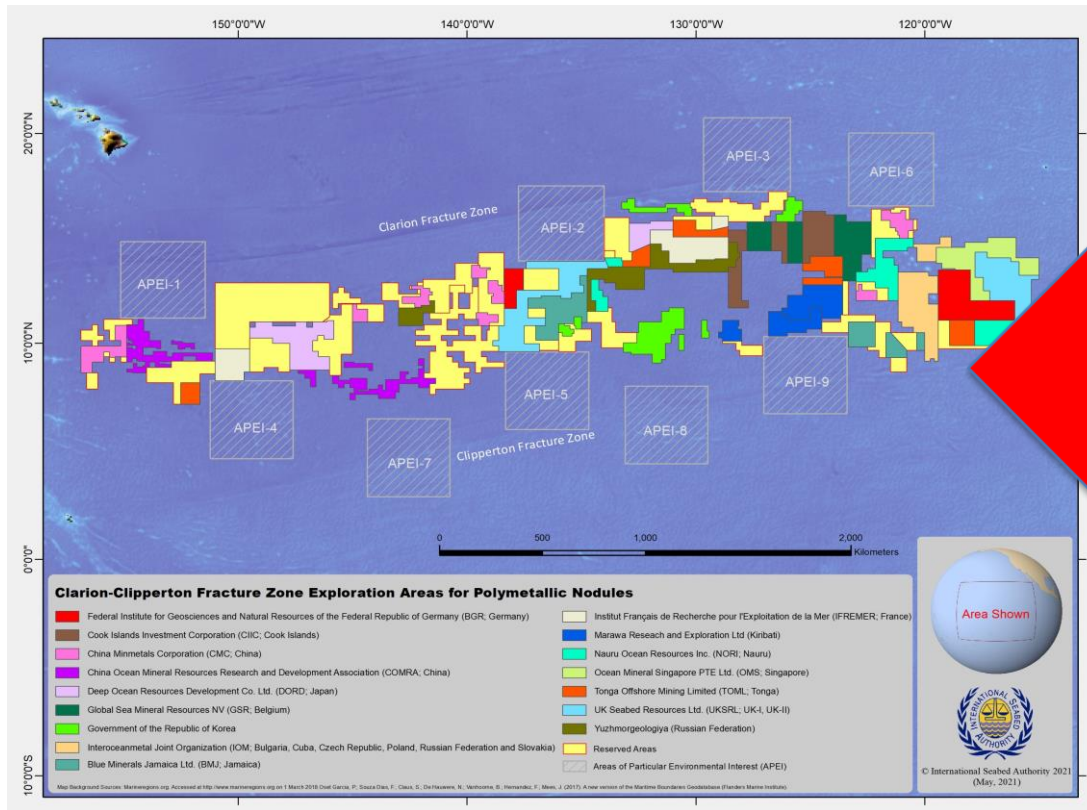
Practical application

- To what extent are current ABMTs **transboundary**?
- Can – and if so how and in what format – **APEIs**, now established in the CCZ, be **replicated to other regions**?
- What guidance exists for contractors to **designate and monitor IRZs and PRZs**?
- Do **APEIs, IRZs and PRZs overlap, interact or complement** one another?
- When is it necessary to have ABMTs protecting specific sites and/or areas, versus networks of ABMTs? And relatedly, what constitutes a **“network” of protected areas** and/or ABMTs?

Legal understandings and principles

- How do the **legal regimes for the high seas and the Area** interact?
- How do we define **harm**, and how does it **interact with the environmental mandate** of the ISA?
- How to define/understand **“best environmental practices”**?
- What is the nature and extent of the **precautionary principle/approach**, and how is it applied?
- Could the **definition of “activities in the Area”** evolve with the (potential) evolution of the environmental task of the ISA?

3D ABMTs?

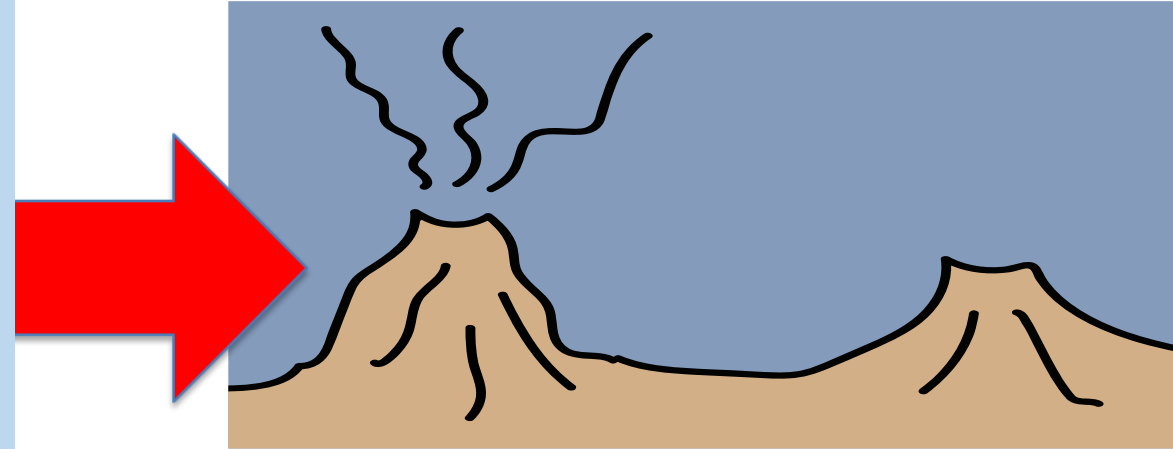


3D ABMTs?

Art. 145 UNCLOS

Necessary measures shall be taken in accordance with this Convention with respect to activities in the Area to ensure **effective protection for the marine environment from harmful effects which may arise from such activities**. To this end the Authority shall adopt appropriate rules, regulations and procedures for inter alia:

- (a) **the prevention, reduction and control of pollution and other hazards to the marine environment**, including the coastline, and of **interference with the ecological balance of the marine environment**, particular attention being paid to the need for protection from harmful effects of **such activities as drilling, dredging, excavation, disposal of waste, construction and operation or maintenance of installations, pipelines and other devices related to such activities**;
- (b) the protection and conservation of the natural resources of the Area and the **prevention of damage to the flora and fauna of the marine environment**.

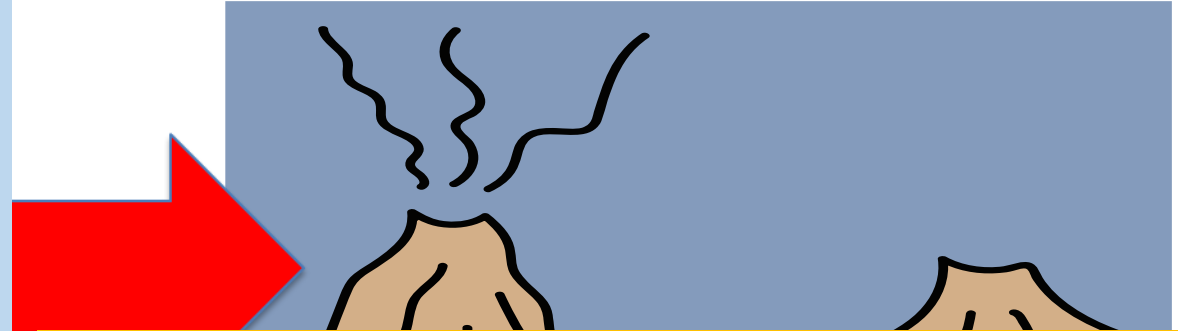


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Reg. 1(3)(c) Exploration Regulations

Schedule, Draft Exploitation Regulations

“Marine environment” includes the physical, chemical, geological and biological components, conditions and factors which interact and determine the productivity, state, condition and quality [**and connectivity**] **of the marine ecosystem(s), the waters of the seas and oceans and the airspace above those waters, as well as the seabed and ocean floor and subsoil thereof.**

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Art. 17(2)(f) Annex III UNCLOS

Protection of the marine environment:

Rules, regulations and procedures shall be drawn up in order to **secure effective protection of the marine environment from harmful effects directly resulting from activities in the Area** or from shipboard processing immediately above a mine site of minerals derived from that mine site, taking into account the extent to which such **harmful effects may directly result from drilling, dredging, coring and excavation and from disposal, dumping and discharge into the marine environment of sediment, wastes or other effluents**.

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PART VII

HIGH SEAS

SECTION 1. GENERAL PROVISIONS

Article 86

Application of the provisions of this Part

The provisions of this Part apply to all parts of the sea that are not included in the exclusive economic zone, in the territorial sea or in the internal waters of a State, or in the archipelagic waters of an archipelagic State. This article does not entail any abridgement of the freedoms enjoyed by all States in the exclusive economic zone in accordance with article 58.

Article 87

Freedom of the high seas

1. The high seas are open to all States, whether coastal or land-locked. Freedom of the high seas is exercised under the conditions laid down by this Convention and by other rules of international law. It comprises, *inter alia*, both for coastal and land-locked States:

- (a) freedom of navigation;
- (b) freedom of overflight;
- (c) freedom to lay submarine cables and pipelines, subject to Part VI;
- (d) freedom to construct artificial islands and other installations permitted under international law, subject to Part VI;
- (e) freedom of fishing, subject to the conditions laid down in section 2;
- (f) freedom of scientific research, subject to Parts VI and XIII.

2. These freedoms shall be exercised by all States with due regard for the interests of other States in their exercise of the freedom of the high seas, and also with due regard for the rights under this Convention with respect to activities in the Area.

Article 88

Reservation of the high seas for peaceful purposes

The high seas shall be reserved for peaceful purposes.

Article 89

Invalidity of claims of sovereignty over the high seas

No State may validly purport to subject any part of the high seas to its sovereignty.

PART XI

THE AREA

SECTION 1. GENERAL PROVISIONS

Article 133

Use of terms

For the purposes of this Part:

- (a) "resources" means all solid, liquid or gaseous mineral resources *in situ* in the Area at or beneath the seabed, including polymetallic nodules;
- (b) resources, when recovered from the Area, are referred to as "minerals".

Article 134

Scope of this Part

1. This Part applies to the Area.
2. Activities in the Area shall be governed by the provisions of this Part.
3. The requirements concerning deposit of, and publicity to be given to, the charts or lists of geographical coordinates showing the limits referred to in article 1, paragraph 1(1), are set forth in Part VI.
4. Nothing in this article affects the establishment of the outer limits of the continental shelf in accordance with Part VI or the validity of agreements relating to delimitation between States with opposite or adjacent coasts.

Article 135

Legal status of the superjacent waters and air space

Neither this Part nor any rights granted or exercised pursuant thereto shall affect the legal status of the waters superjacent to the Area or that of the air space above those waters.

SECTION 2. PRINCIPLES GOVERNING THE AREA

Article 136

Common heritage of mankind

The Area and its resources are the common heritage of mankind.

PART VII

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Article 135 UNCLOS

Legal status of the superjacent waters and air space

Neither the exercise of these rights nor the status of the high seas shall be affected by the fact that a State exercises jurisdiction over the continental shelf

Article 78 UNCLOS (part VI on the continental shelf)

Legal status of the superjacent waters and air space and the rights and freedoms of other States

1. The rights of the coastal State over the continental shelf **do not affect the legal status of the superjacent waters** or of the air space above those waters.
2. The exercise of the rights of the coastal State over the continental shelf **must not infringe or result in any unjustifiable interference with navigation and other rights and freedoms of other States as provided for in this Convention.**

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Protecting deep seabed hydrothermal vent fields through area-based management tools

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UCWOSL luncheon

7 December 2021