

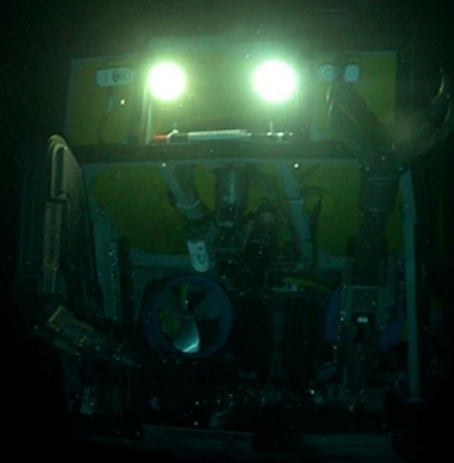
# International law and policy perspectives



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IRZ/PRZ Workshop  
Berlin, Germany  
27-29 September

Photo credit: V. Tunnicliffe<sup>1</sup>



MANAGING IMPACTS OF DEEP  
SEA RESOURCE EXPLOITATION

RESEARCH HIGHLIGHTS

MIDAS

[www.eu-midas.net](http://www.eu-midas.net)

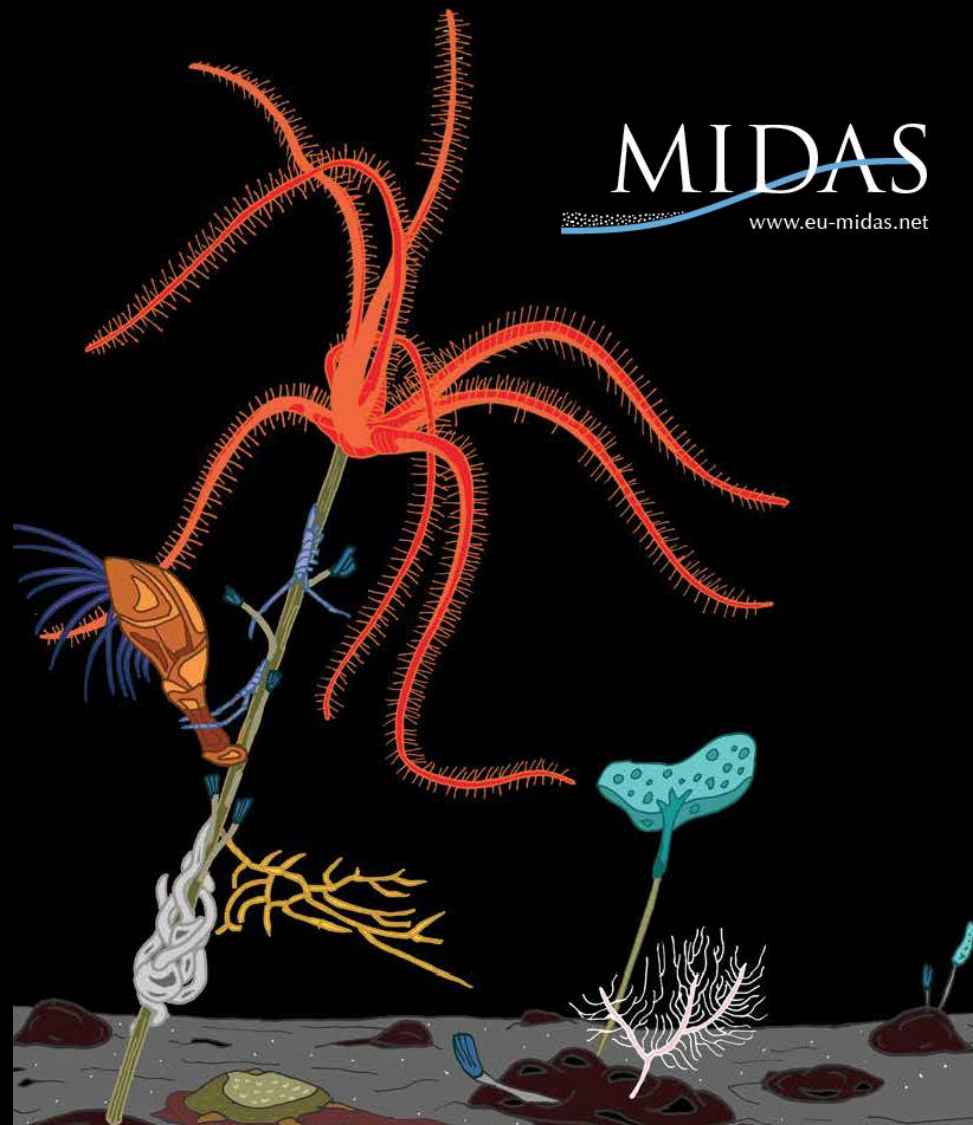


IMPLICATIONS OF MIDAS RESULTS FOR POLICY MAKERS:

RECOMMENDATIONS FOR  
FUTURE REGULATIONS

MIDAS

[www.eu-midas.net](http://www.eu-midas.net)



MIDAS  
[www.eu-midas.net](http://www.eu-midas.net)

MANAGING IMPACTS OF DEEP  
SEA RESOURCE EXPLOITATION

# Many known unknowns ...

## Plumes

- Extent and duration of plumes
- Survivability thresholds
- Effects of plumes in water column all depths
- Potential toxicity of plumes
- Possible mitigation measures

## Ecotoxicology

- Effects of toxicity from seafloor mining
- Toxic effects of returned water and transshipment plumes
- Eco toxicity measures and indicators

## Species connectivity

- How species make connections across range
- Connectivity of vent and non-vent fauna

## Ecosystem function

- How to measure ecosystem function
- How to measure? Technologies, sensors & methods

## Ecosystem recovery

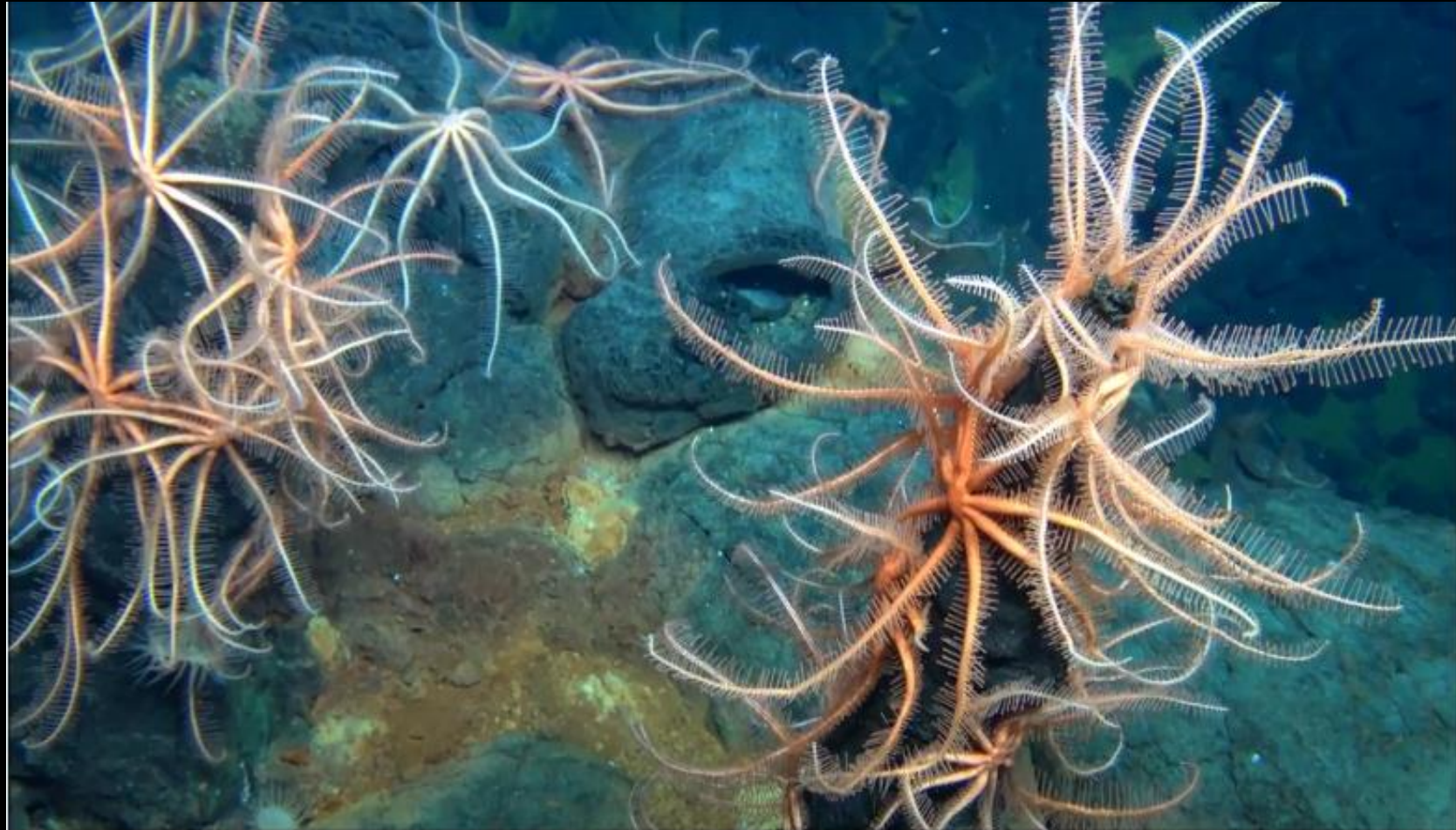
- Key species and community
- Effects of sediment compaction
- Mining deposit of semi-fluid layer

## Wider issues

- Noise, light, vibration
- Adjacent areas
- Effectiveness of mitigation strategies.

# Bottom line: effective protection entails:

- Rules to achieve effective protection and avoid serious harm
- Precautionary approach throughout
- IRZs/PRZs need to enable effective measurements for timely response



→ Precautionary design, thresholds, indicators and regulatory limits



**“The Area and its resources are the  
Common Heritage of Mankind”  
UNCLOS Articles 136-149**

- No sovereignty
- Rights vested in humankind
  - Benefit of mankind
- Sharing of economic benefits

UNCLOS Art. 145: Necessary measures shall be taken .....to ensure effective protection for the marine environment from harmful effects...



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## UNCLOS Art. 143:

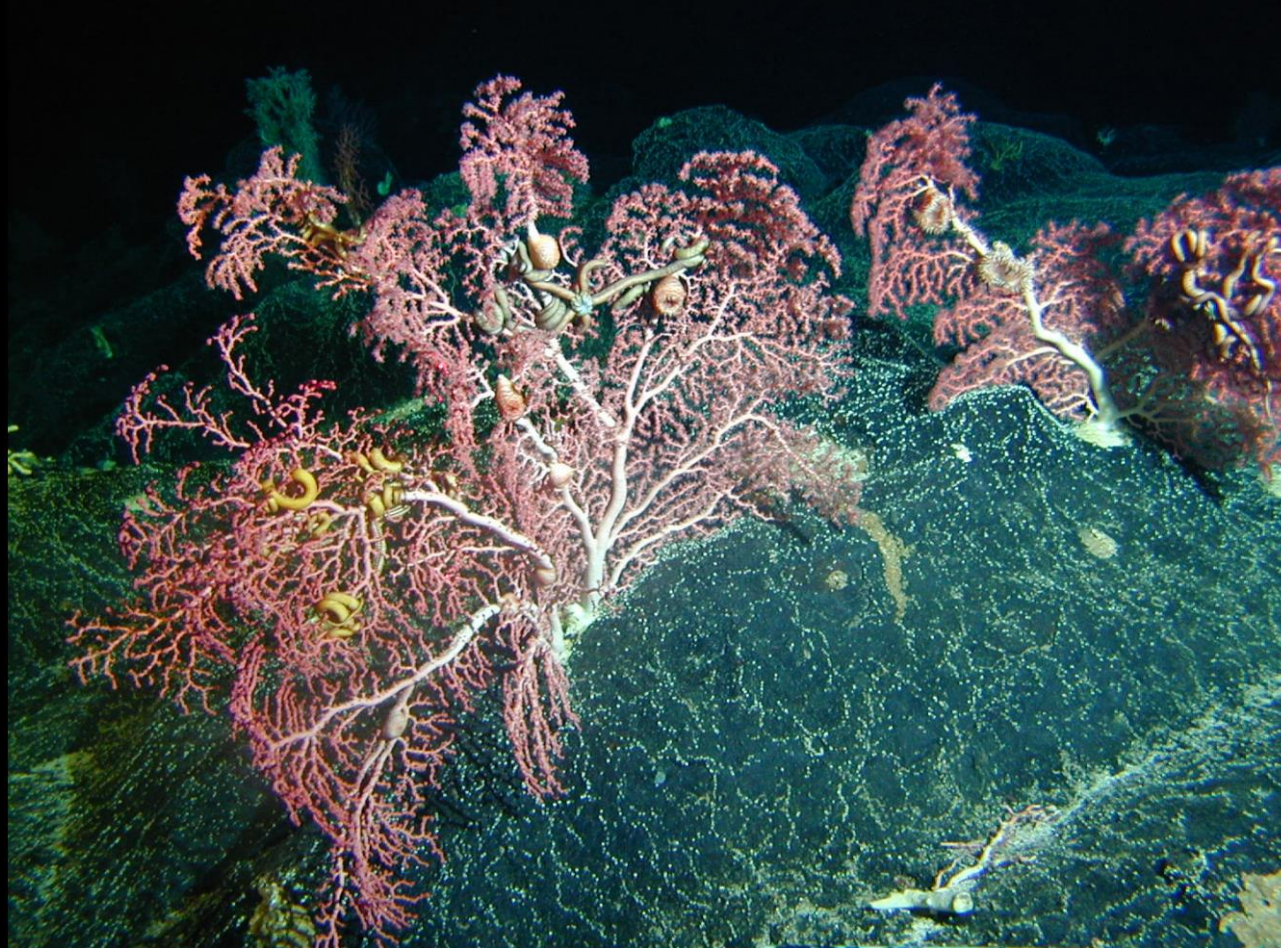
Marine scientific research shall be carried out  
“for the benefit of mankind as a whole”



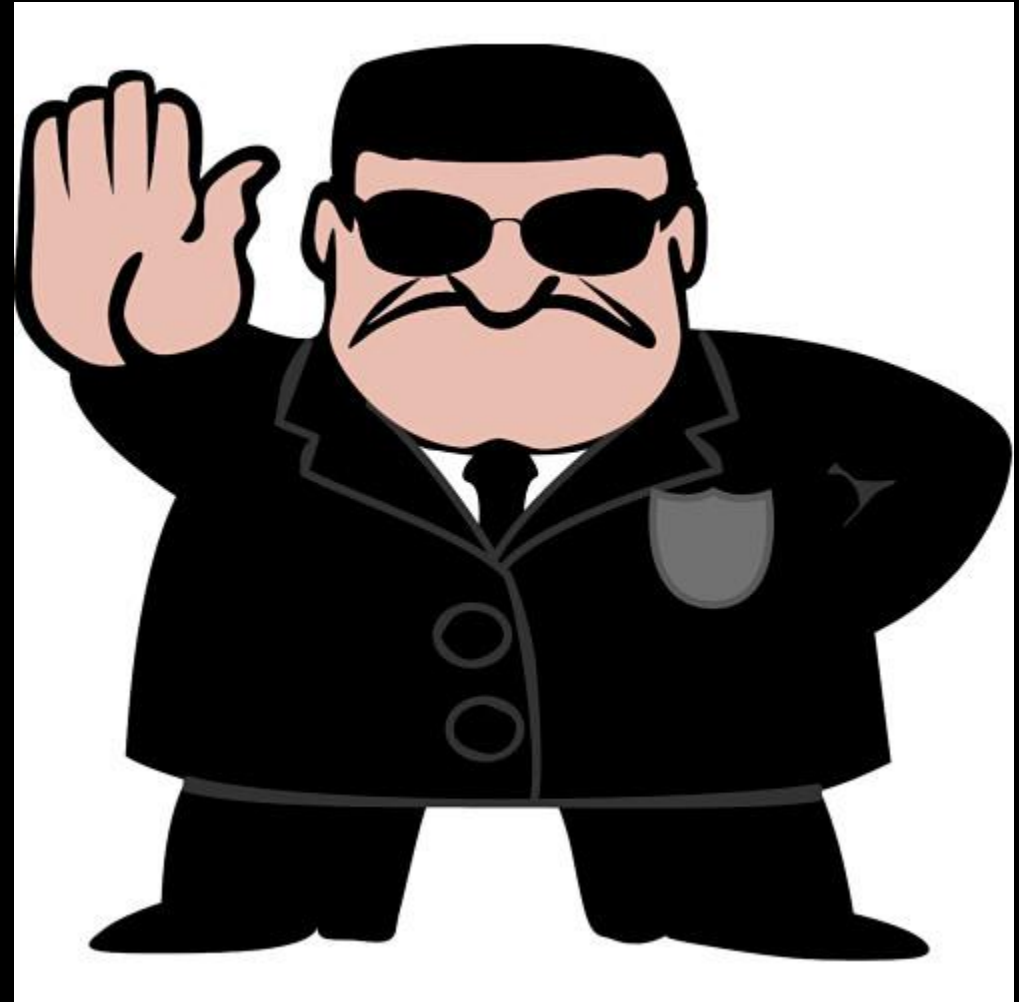
Photo courtesy David Billet



Article 139: States have responsibility to ensure compliance and are liable for damage caused by failure to carry out that responsibility



UNCLOS Art. 153:  
ISA shall exercise  
control necessary to  
secure compliance



Article / Provision	Content
Art 136	Common heritage of mankind – area & resources
Art 192	Obligation to <b>protect and preserve</b> the marine environment
194.5	<b>Protect &amp; preserve</b> rare & fragile ecosystems
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Principles	Best available science, best environmental practices
Art 165.2	<b>LTC shall...</b> (e) make recommendations to the Council on the <b>protection of the marine environment</b> , taking into account the views of recognized experts in that field; (f) formulate & submit to Council the rules regulations and procedures referred to in article 162.2(o) taking into account all relevant factors including assessments of environmental implications of activities in Area;
Art 165.2(k)	make recommendations to the Council to issue emergency orders, which may include orders for the suspension or adjustment of operations, <b>to prevent serious harm to the marine environment arising out of activities in the Area</b> . Such recommendations shall be taken up by the Council on a priority basis;
Art 165.2(l)	(l) make recommendations to the Council <b>to disapprove areas for exploitation</b> ...where substantial evidence indicates the risk of serious harm to the marine environment;

# UNCLOS Art. 145: Necessary measures shall be taken ....to ensure “effective protection” from “harmful effects”...

To this end the Authority shall adopt appropriate rules, regulations and procedures for *inter alia*:



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(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.

# Dissecting Article 145: what does it mean?

## Ensuring effective protection of the marine environment

**Who?** Authority, States, Contractors

**To what?** to activities in the Area

**Why:** to ensure effective protection for the marine environment

**From what?** from *harmful effects* which may arise from such activities.

**What specifics?** the Authority shall adopt appropriate RRP, for *inter alia*:

**(a) Prevention, reduction and control of:**

- pollution
- other hazards to the marine environment, including the coastline,
- of **interference with the ecological balance** of the marine environment,

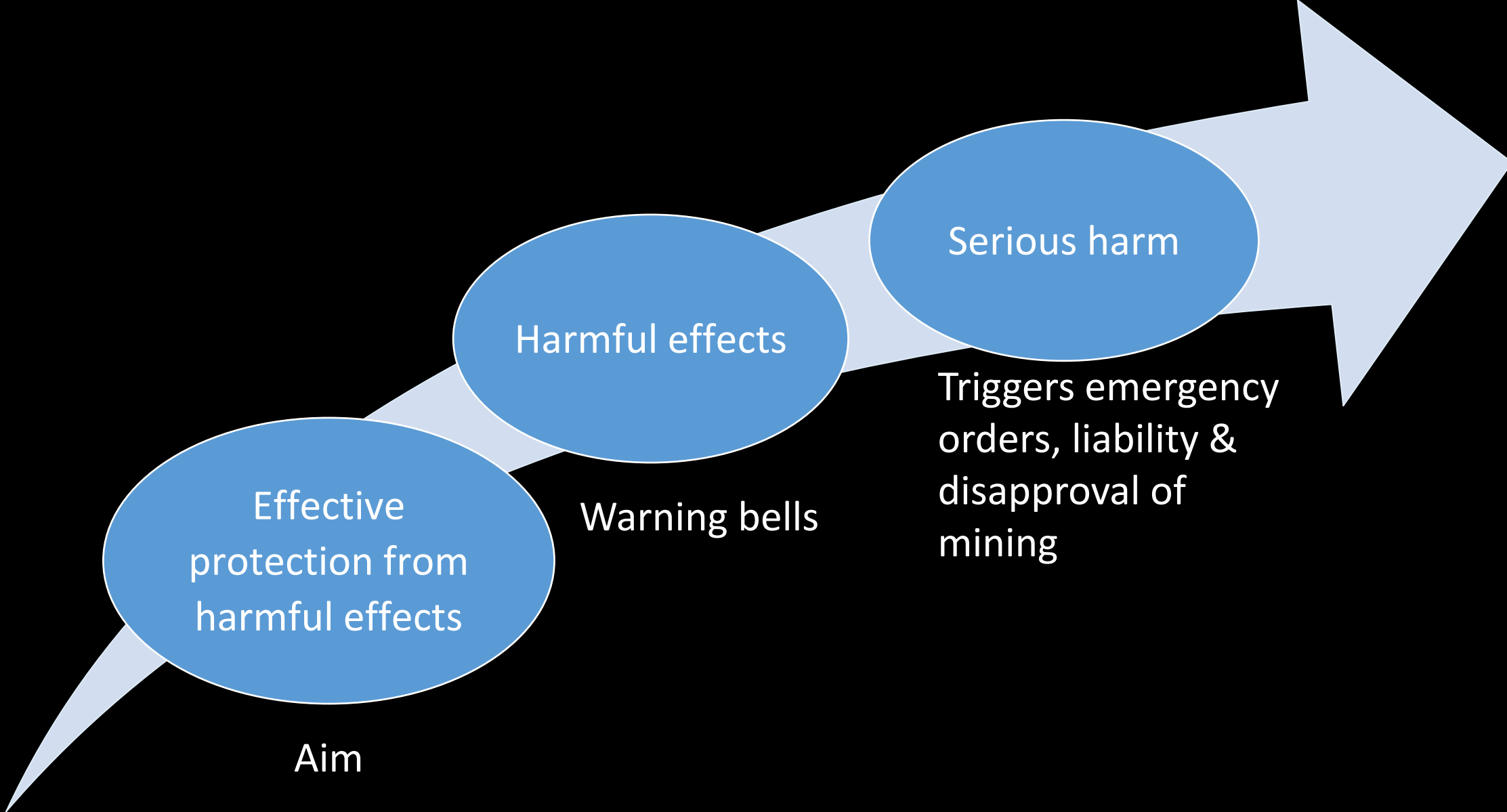
**(b) Protection and conservation of** the natural resources of the Area; and

- **Prevention of damage** to the flora and fauna of the marine environment.

# What is significance of “serious harm”?

1. The Council can issue emergency orders (162.2(w))
2. The Council can disapprove areas for exploitation ... where substantial evidence indicates a risk of serious harm (162.2 (x)),
3. A court or tribunal may prescribe provisional measures, *inter alia*, to prevent serious harm to the marine environment (290.1).





# Contractor obligations under draft regulations

## Section 6 Diligent operations

- Ensure the effective protection of the Marine Environment from harmful activities and monitor the impact of the Exploitation Activities and ensure that they do not cause serious harm to the Marine Environment;

**DR Annex VII Standard Clauses for Exploitation Contract**



# How to define Serious Harm?

## Regulation 1 of the *Exploration Regulations*:

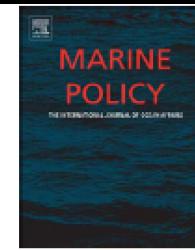
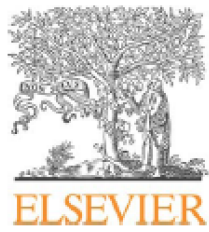
- any effect from activities in the Area on the marine environment which **represents a significant adverse change** in the marine environment determined according to the rules, regulations and procedures adopted by the Authority on the basis of internationally recognized standards and practices.

*Exploration Regulations*, regulation 1(3)(f).

# FAO criteria for defining significance of impact:

When determining the scale and significance of an impact, the following six factors should be considered:

- i. the intensity or severity of the impact at the specific site being affected;
- ii. the spatial extent of the impact relative to the availability of the habitat type affected;
- iii. the sensitivity/vulnerability of the ecosystem to the impact;
- iv. the ability of an ecosystem to recover from harm, and the rate of such recovery;
- v. the extent to which ecosystem functions may be altered by the impact; and
- vi. the timing and duration of the impact relative to the period in which a species needs the habitat during one or more of its life history stages.



## Defining “serious harm” to the marine environment in the context of deep-seabed mining



.... “seabed mining actions that may **cause harmful effects or serious harm** across all targeted resources include:

- direct removal and destruction of seafloor habitat and organisms;
- alteration of the substrate and its geochemistry;
- modification of sedimentation rates and food webs;
- changes in substrate availability, heterogeneity and flow regimes;
- suspended sediment plumes
- released toxins
- contamination associated with noise, light or chemical leakage

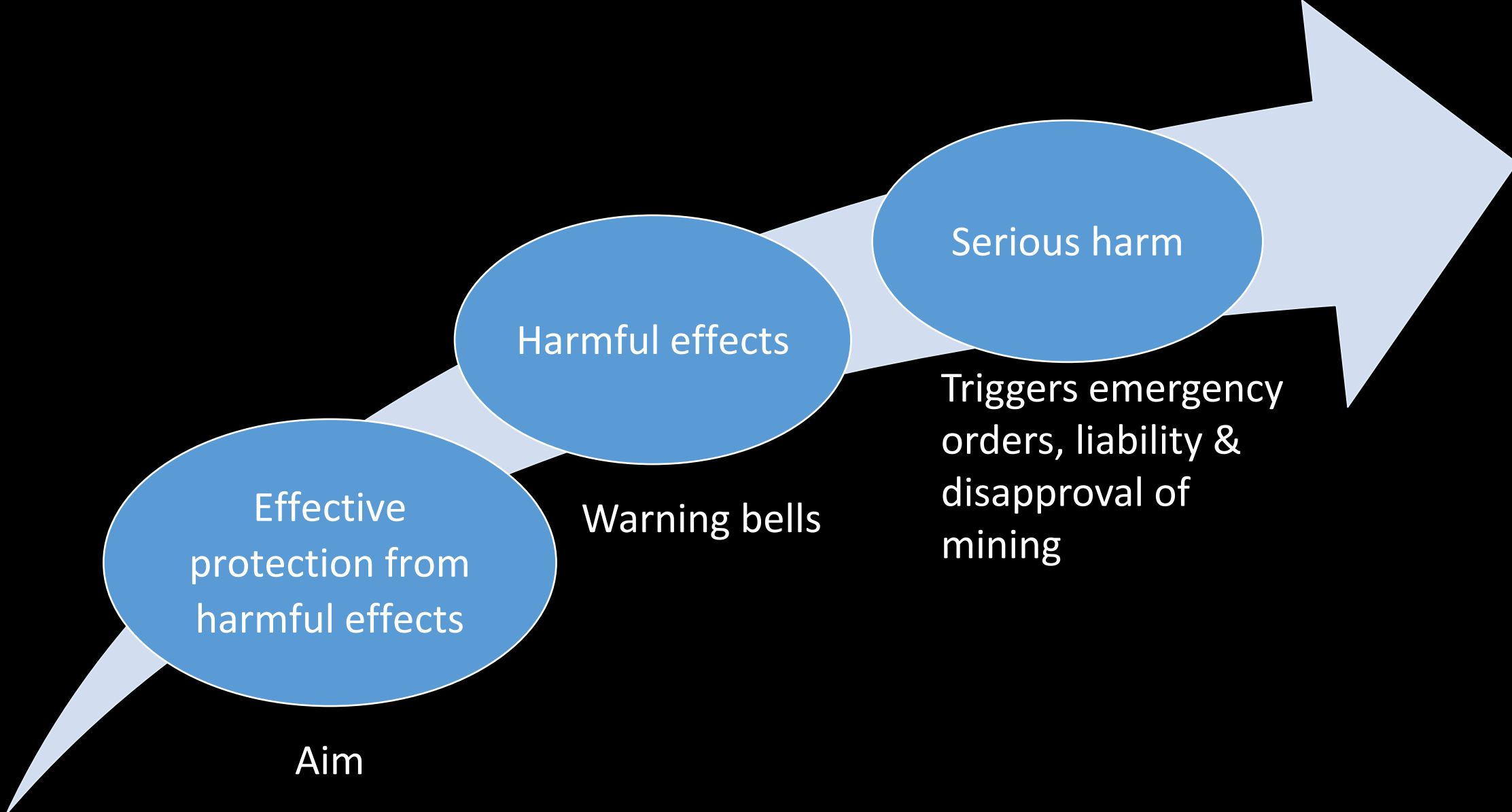
- Extent
- Duration and frequency
- Intensity or magnitude

- Probability
- Sensitivity/vulnerability
- Cumulative effects

# So what does this have to do with IRZs and PP7c?



Slide credit: Lisa Levin; Artwork Tanya Young



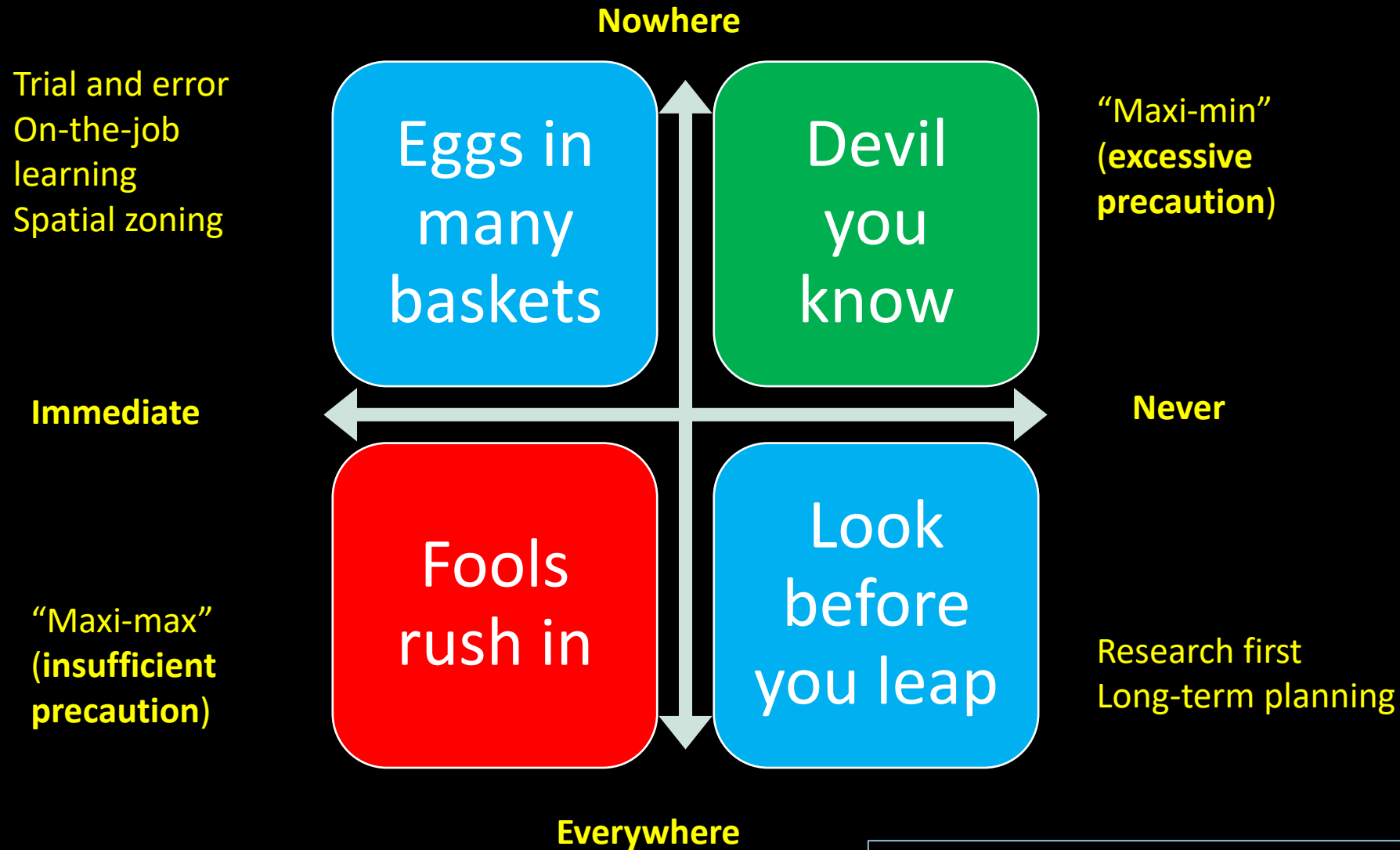
# Dealing with Uncertainty

Precaution



Adaptive  
management

# Precautionary Strategies for DSM



# Key Features of Adaptive Management

- 1. A known and particularised base state: knowing what counts in ecosystem health, well-being and integrity; what is important in that ecosystem**
2. Monitoring and reporting of the effects of an activity against that base state
3. Risk/certainty trade-off: Learning by doing by constraining the activity
  - Spatial scale
  - Temporal scale
  - Stage(s)
4. Decision points
  - Thresholds
  - Triggers
  - Indicators
5. Adapt/modify activity



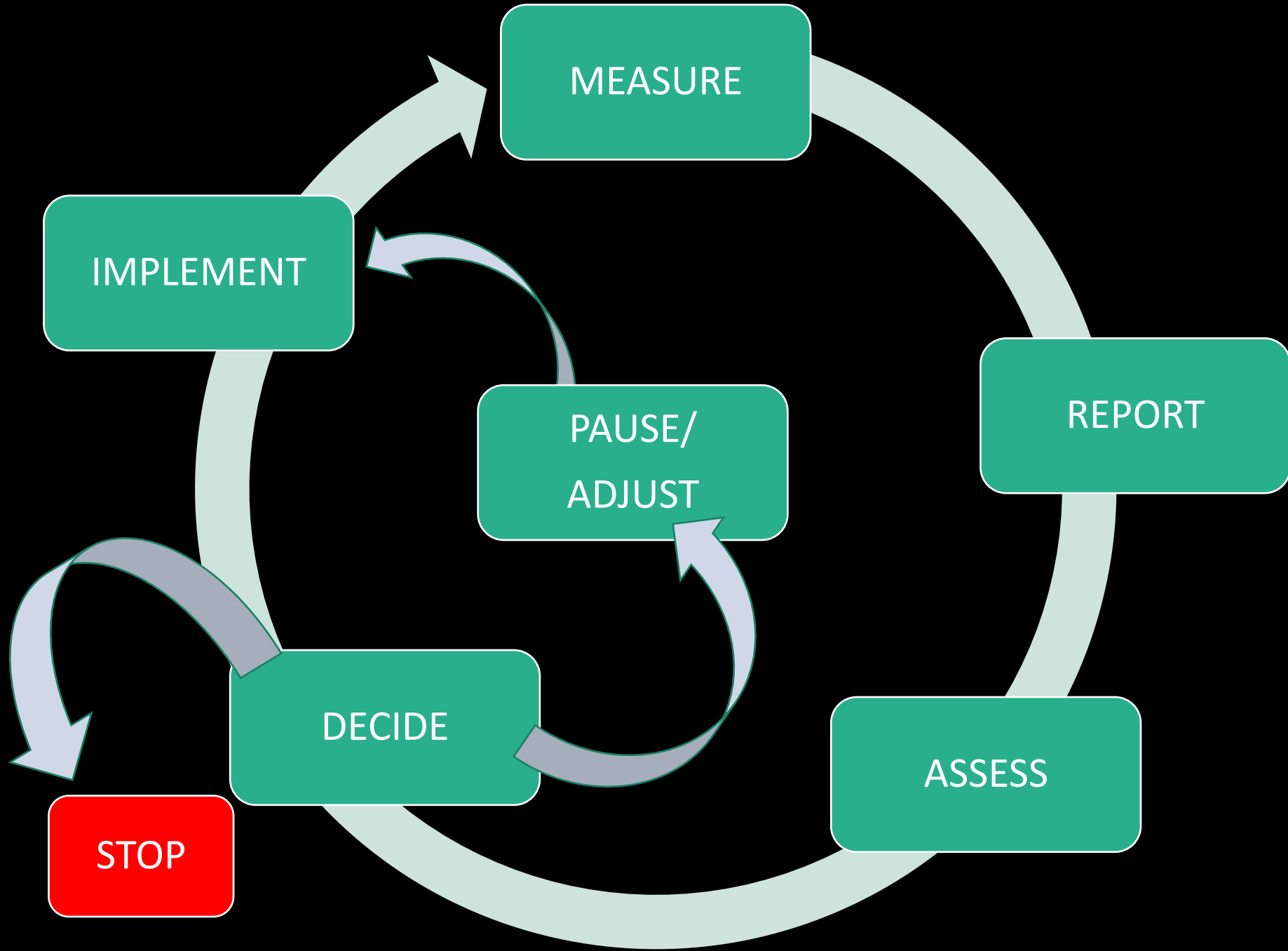
# Adaptive Management

An adaptive management approach includes—

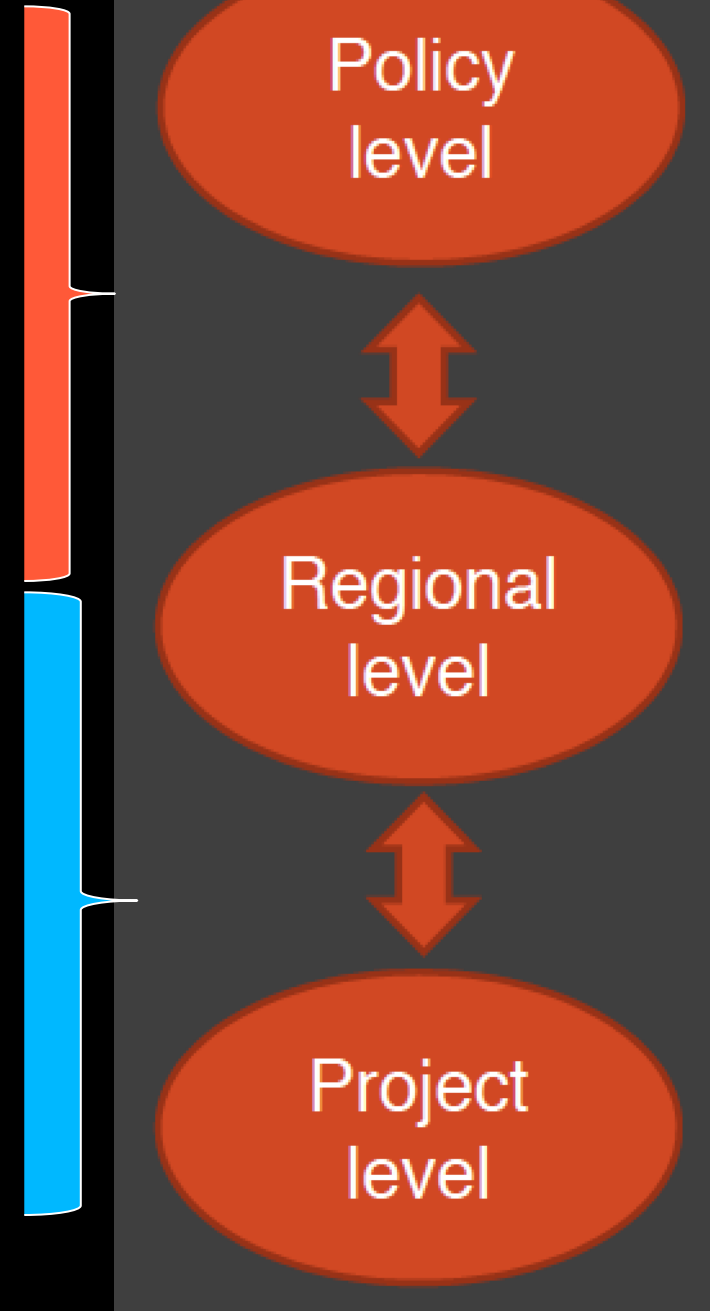
(a) allowing an activity to commence on a **small scale or for a short period** so that its effects on the environment and existing interests can be **monitored**:

(b) **any other approach** that allows an activity to be undertaken so that its **effects can be assessed** and the activity discontinued, or continued with or without amendment, on the basis of those effects.

s64 (2) NZ EEZ Act 2012

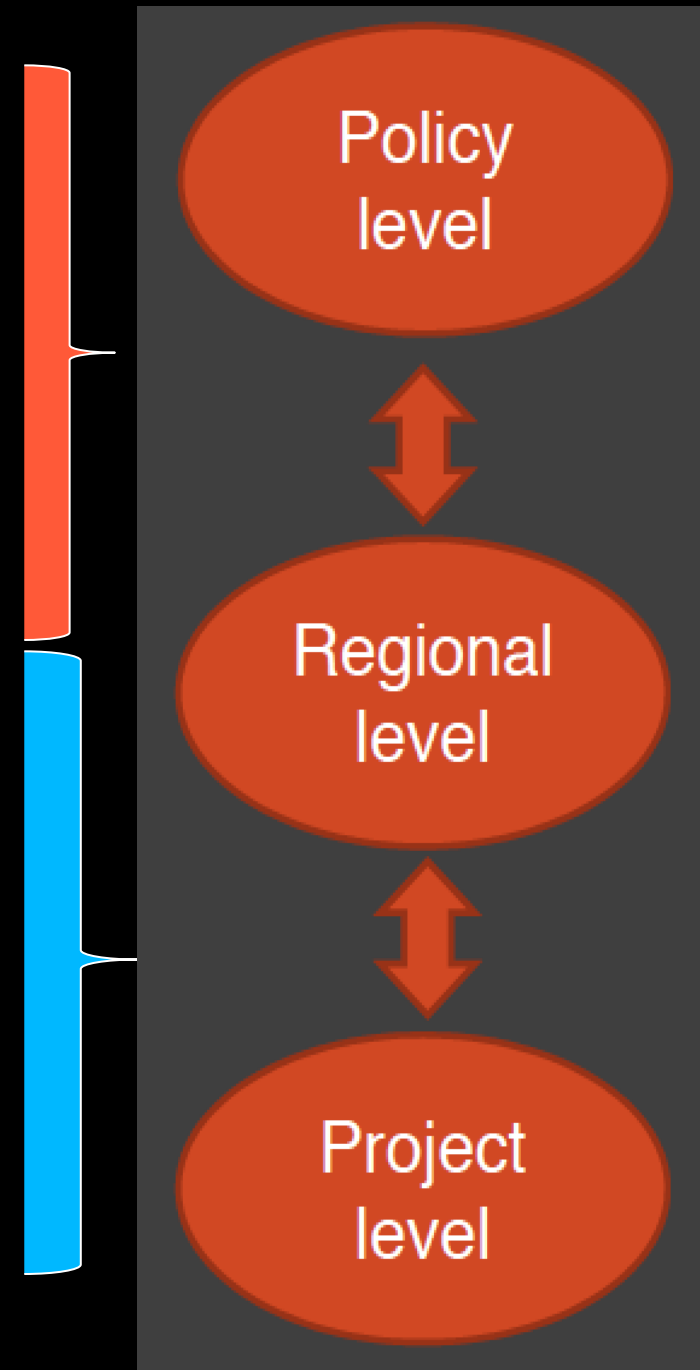


# Global and regional elements

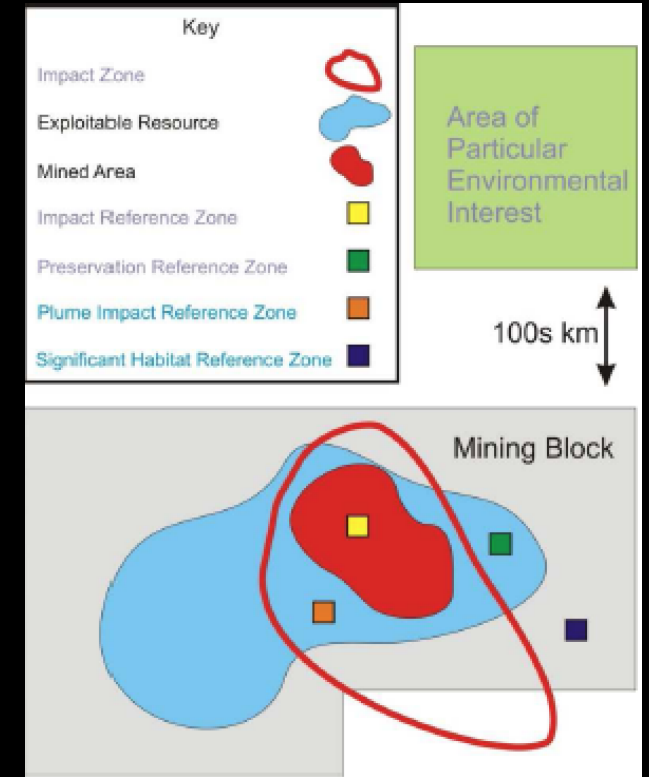
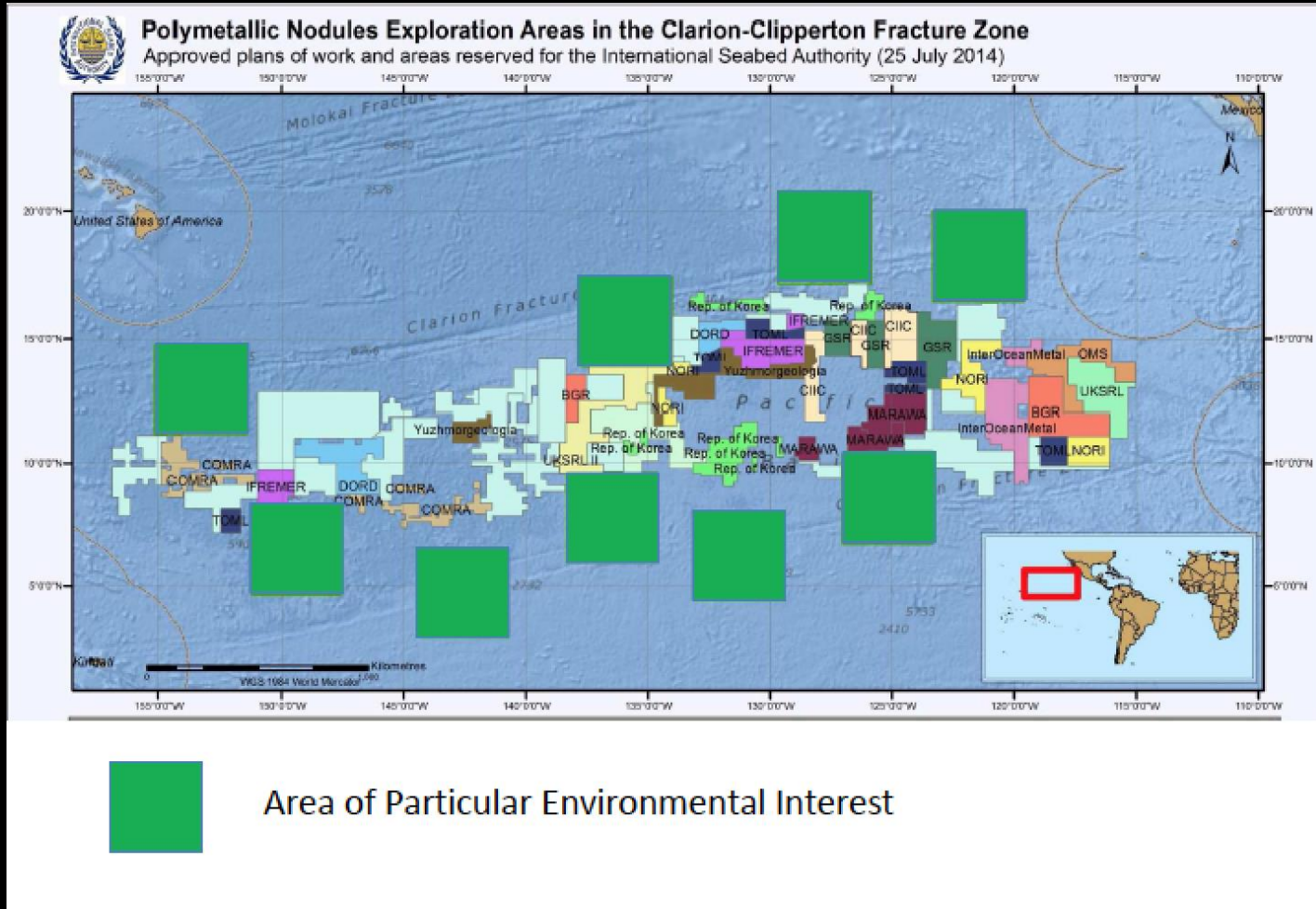


# Tiered governance approach

1. Strategic planning and environmental objectives
2. Regional environmental management plans
3. Site level regulations, standards, environmental management and monitoring plans



# Spatial Management (APEIs, PRZs ,IRZs) could address key environmental objectives



**“Impact reference zones”** are areas to be used for assessing the effect of each contractor’s activities in the Area on the marine environment and which are representative of the environmental characteristics of the Area.

**“Preservation reference zones”** means areas in which no mining shall occur to ensure representative and stable biota of the seabed in order to assess any changes in the flora and fauna of the marine environment.

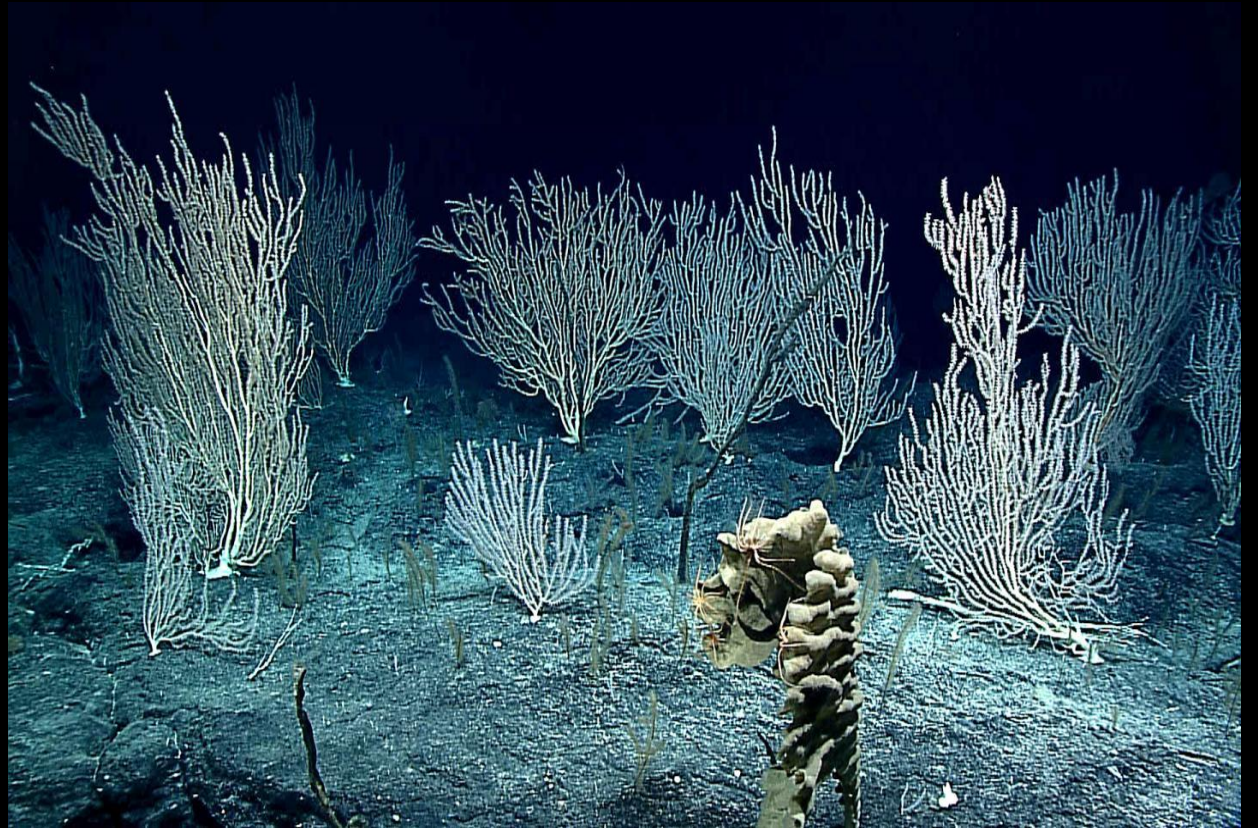
Can be designed to promote habitat heterogeneity, connectivity, and resilience if the are target objectives, Jones and Weaver – White Paper

# Tiered governance approach



# Ensuring effective protection of the marine environment: what will it take?

- Starting point
  - Avoiding harmful effects
  - Thresholds, triggers, limits
  - Indicators
- Dealing with uncertainty
  - Many unknown unknowns
  - Precautionary Approach
  - Adaptive Management
- Tiered approach
  - Global objectives
  - Regional planning
  - Site specific



Biogenic (Animal) habitats promote diversity

# Need to shorten list of known unknowns

## Plumes

- Extent and duration of plumes
- Survivability thresholds
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## Ecotoxicology

- Effects of toxicity from seafloor mining
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- Effectiveness of mitigation strategies.



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**Thank you!**



# What are “Harmful effects”?

- **pollution**
- **other hazards to the marine environment, including the coastline,**
- **interference with the ecological balance of the marine environment,**

**Protect and conserve natural resources**

**Prevent loss of biodiversity**

Baselines  
Environmental targets  
Monitoring capability  
Response capacity  
Performance assessment



# Application of Precautionary Approach

## *The Exploration Regulations*

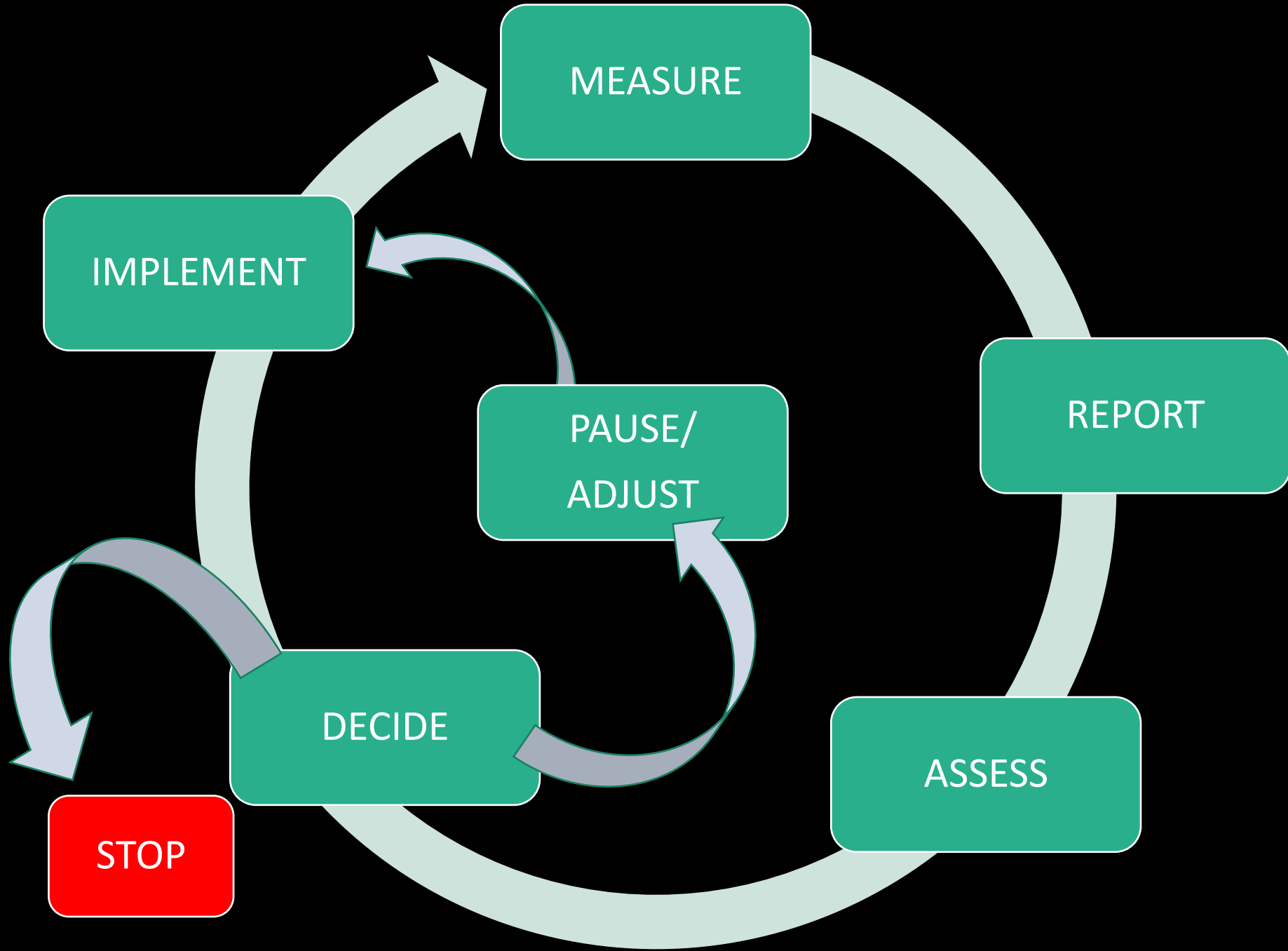
“In order to ensure effective protection for the marine environment *from harmful effects* which *may* arise from activities in the Area, the Authority and sponsoring States shall apply a precautionary approach, as reflected in principle 15 of the Rio Declaration, and best environmental practices.”

*Nodules Regulations*, regulation 31(2); *Sulphides and Crusts Regulations*, regulation 33(2) (emphasis added).

# Plausible indications of potential risks

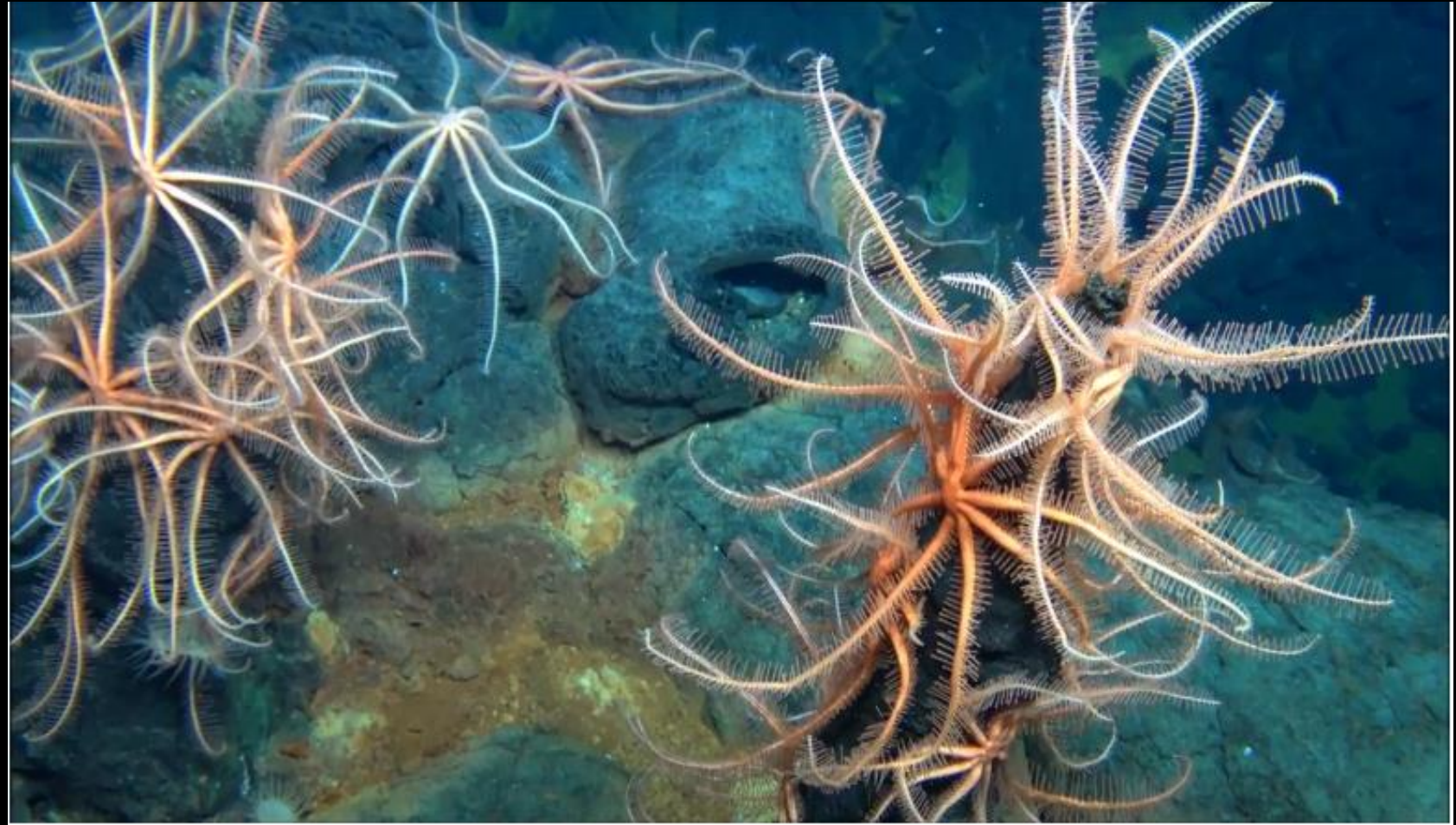
- The due diligence obligation of the sponsoring States requires them to take all appropriate measures to prevent damage that might result from the activities of contractors that they sponsor. This obligation applies in situations where scientific evidence concerning the scope and potential negative impact of the activity in question is insufficient but where there are plausible indications of potential risks.

Seabed Disputes Chamber, 2011. Advisory Opinion on responsibilities and obligations of states sponsoring persons and entities with respect to activities in the Area) (2011 Advisory Opinion) , available at: [www.itlos.org/fileadmin/itlos/documents/cases/case\\_no\\_17/adv\\_op\\_010211.pdf](http://www.itlos.org/fileadmin/itlos/documents/cases/case_no_17/adv_op_010211.pdf).



# Bottom line: effective protection entails:

- Rules to achieve effective protection and avoid serious harm
- Global, regional and project level envtal goals, targets and indicators
- Precautionary approach throughout



- These considerations, including the scientific and the social dimension, must be addressed by the ISA, in accordance with its mandate to control seabed mining in the Area on behalf of humankind, to promote and conduct marine scientific research in the Area, and to protect the marine environment from harmful effects of seabed mining.
- Aline Jaeckel
- LOSC, articles 136, 137, 140, 143, 145, 153(1).

- An effective response requires scientific advice regarding the activity's effect on biodiversity and ecosystem integrity as well as the spatial and temporal scale of the impact.
- This presupposes adequate data to establish environmental baselines and understand ecosystem structures, at least to some extent.
- Second, it requires an agreed, value-based environmental conservation objective to determine what is unreasonable or unacceptable change



- The draft regulations, prepared by the Preparatory Commission, did provide some detail, defining serious harm to the marine environment as:
  - any effect from activities in the Area on the living or non-living components of the marine environment and associated ecosystems beyond that which is negligible or which has been assessed and judged to be acceptable by the Authority pursuant to these regulations and the relevant rules and regulations adopted by the Authority and which represent:
    - (a) significant adverse changes in the living and non-living components of the marine and atmospheric environment;
    - (b) significant adverse changes in the ecosystem diversity, productivity and stability of the biological communities within the environment; or
    - (c) loss of scientific or economic values which is unreasonable in relation to the benefit derived from the activity in question.
- Preparatory Commission for the ISA and ITLOS, LOS/PCN/SCN.3/WP.6/Add.5 (8 February 1990), article 2(2).

# Effective Protection = Article 145 + 192

Importantly, the obligation to protect and preserve the marine environment goes beyond avoiding harm and entails the active enhancement of the state of the marine environment.

Nordquist, Roseene, Yankov and Grandy, UNCLOS, 1982: A Commentary Volume IV

# Effective Protection = Article 145 + 192 + common heritage + due diligence

- **“To ensure” is an “obligation to deploy adequate means, to exercise best possible efforts, to do the utmost, to obtain this result.”**
- **“The standard of due diligence has to be more severe for the riskier activities”**
- **“Uniform application of the highest standards of protection of the marine environment.”**
- **Precautionary principle forms “an integral part of ‘due diligence’ obligation.”**

Seabed Disputes Chamber, 2011. Advisory Opinion on responsibilities and obligations of states sponsoring persons and entities with respect to activities in the Area) (2011 Advisory Opinion) , available at: [www.itlos.org/fileadmin/itlos/documents/cases/case\\_no\\_17/adv\\_op\\_010211.pdf](http://www.itlos.org/fileadmin/itlos/documents/cases/case_no_17/adv_op_010211.pdf).

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Art 162.2.o	<b>Council</b> shall..(ii) adopt and apply provisionally, pending approval by the Assembly, the rules, regulations and procedures of the Authority, and any amendments thereto, taking into account the recommendations of the Legal and Technical Commission or other subordinate organ concerned.
Art 160.2	<b>Assembly</b> (ii) to consider and approve the rules, regulations and procedures of the Authority, and any amendments thereto, provisionally adopted by the Council pursuant to article 162.2 (o)(ii).