



**Overview of international
governance and
scientific issues
regarding the high seas
and deep-water
ecosystems and
biodiversity**





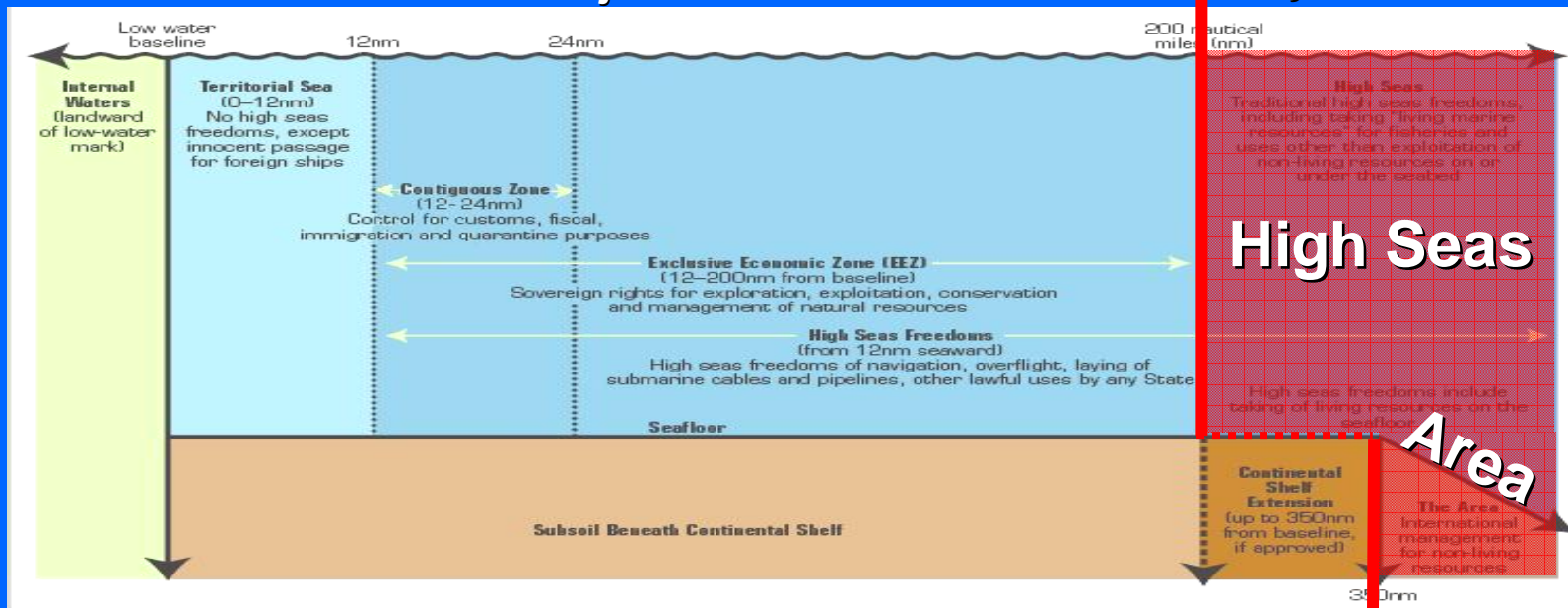
UNEP Coral Reef Unit (CRU)



The oceans have been divided by UNCLOS ...

Maritime zones, boundaries and ocean areas
within national jurisdiction

beyond national jurisdiction



Size: approx. 1/3

approx. 2/3

Depth: shallow waters (<200m) : 10-15%
deep waters (>200m) : 85-90%

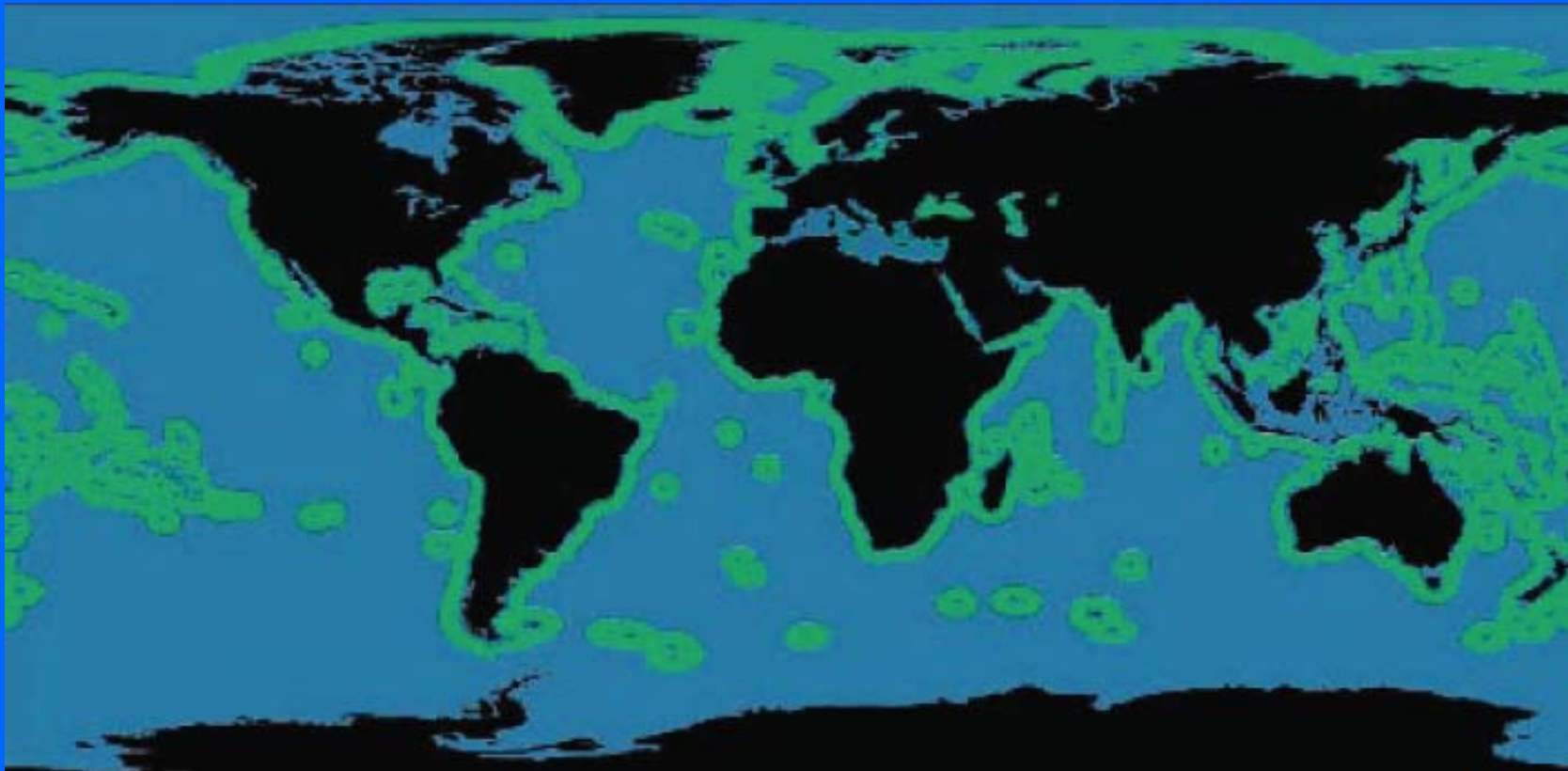
nearly
all deep water



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...64% lies beyond national jurisdiction

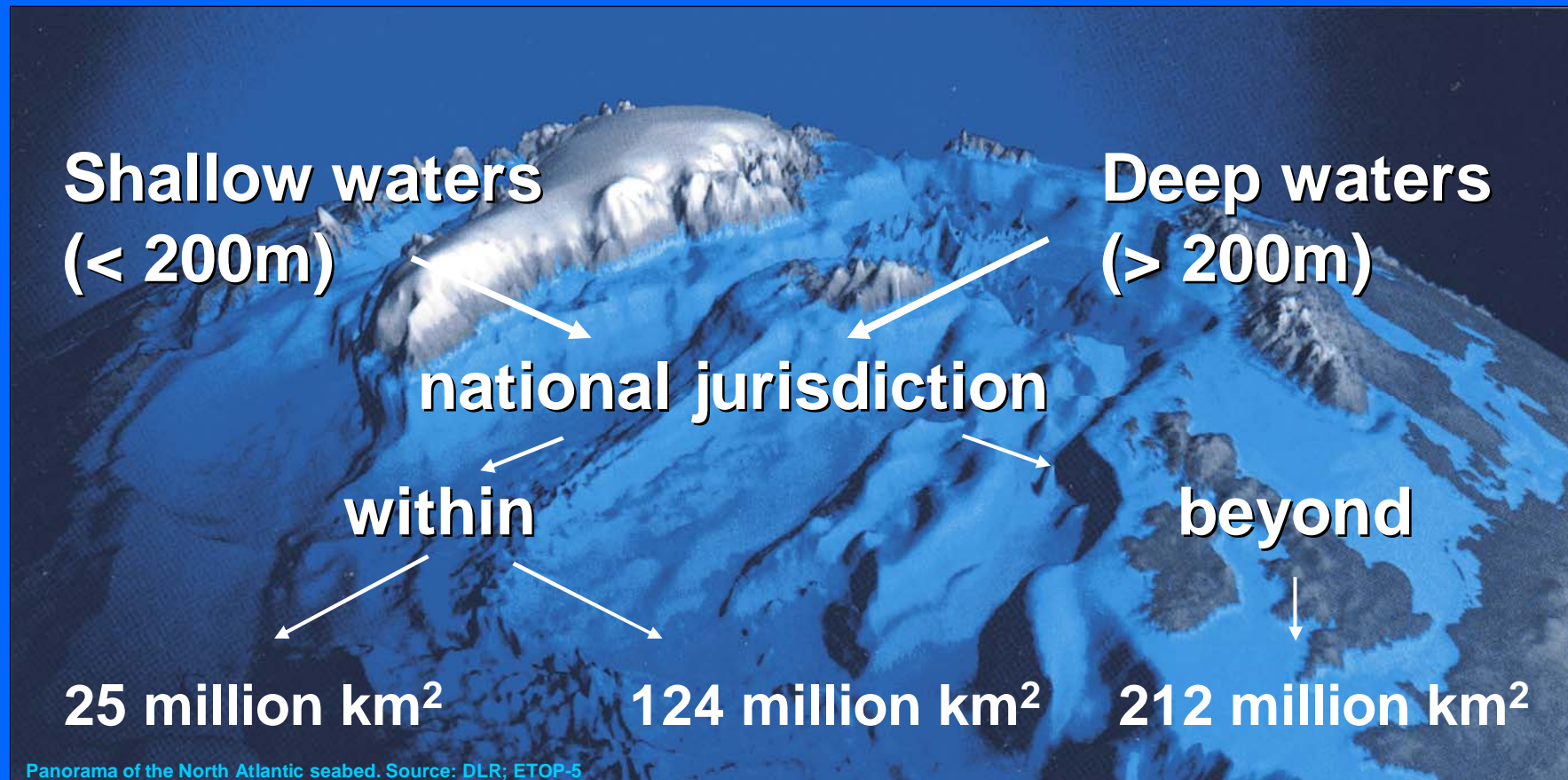




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..... but there is also a large amount of deep waters under national jurisdiction

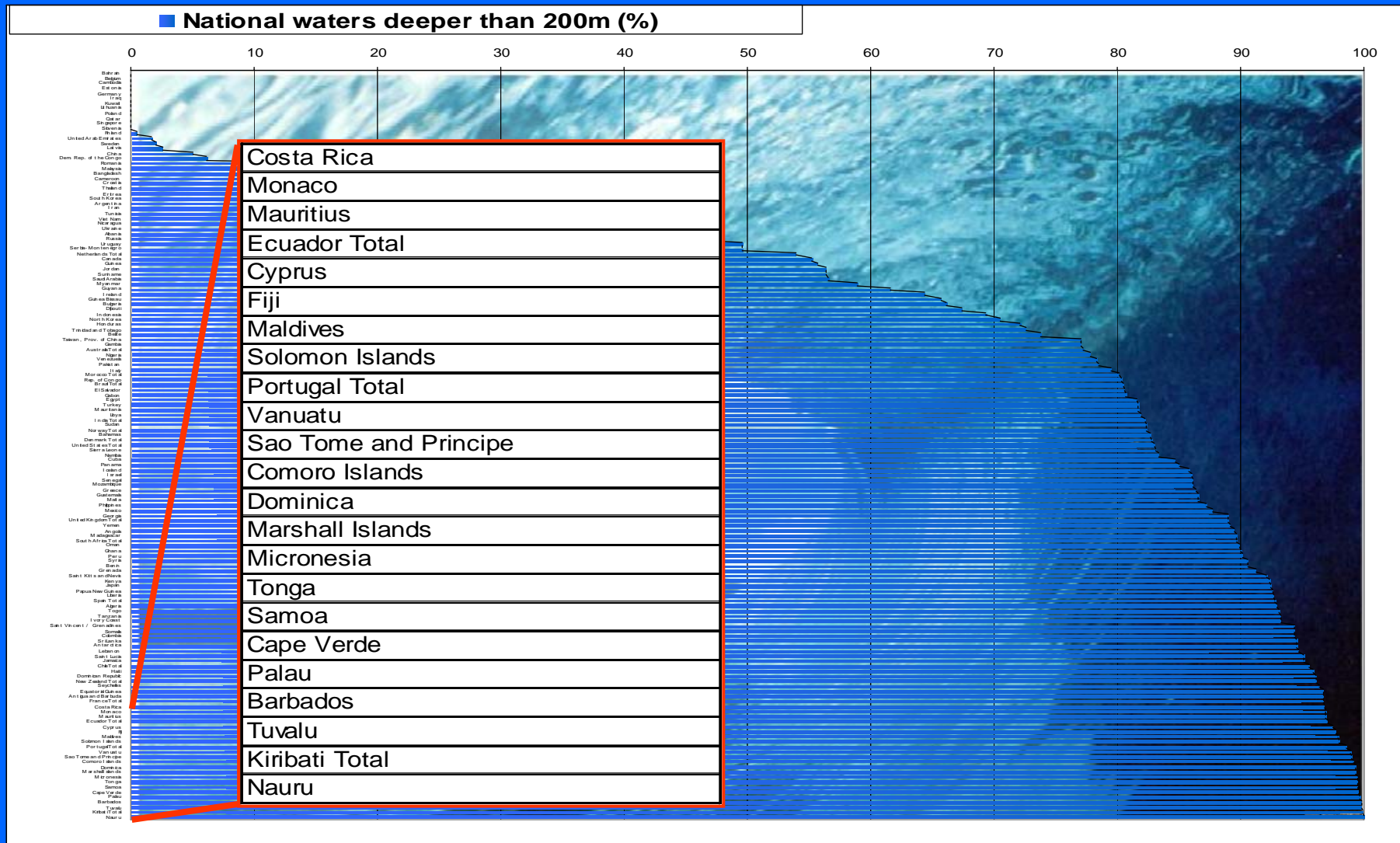




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... in fact, on average about 70% of national waters are deeper than 200m ...

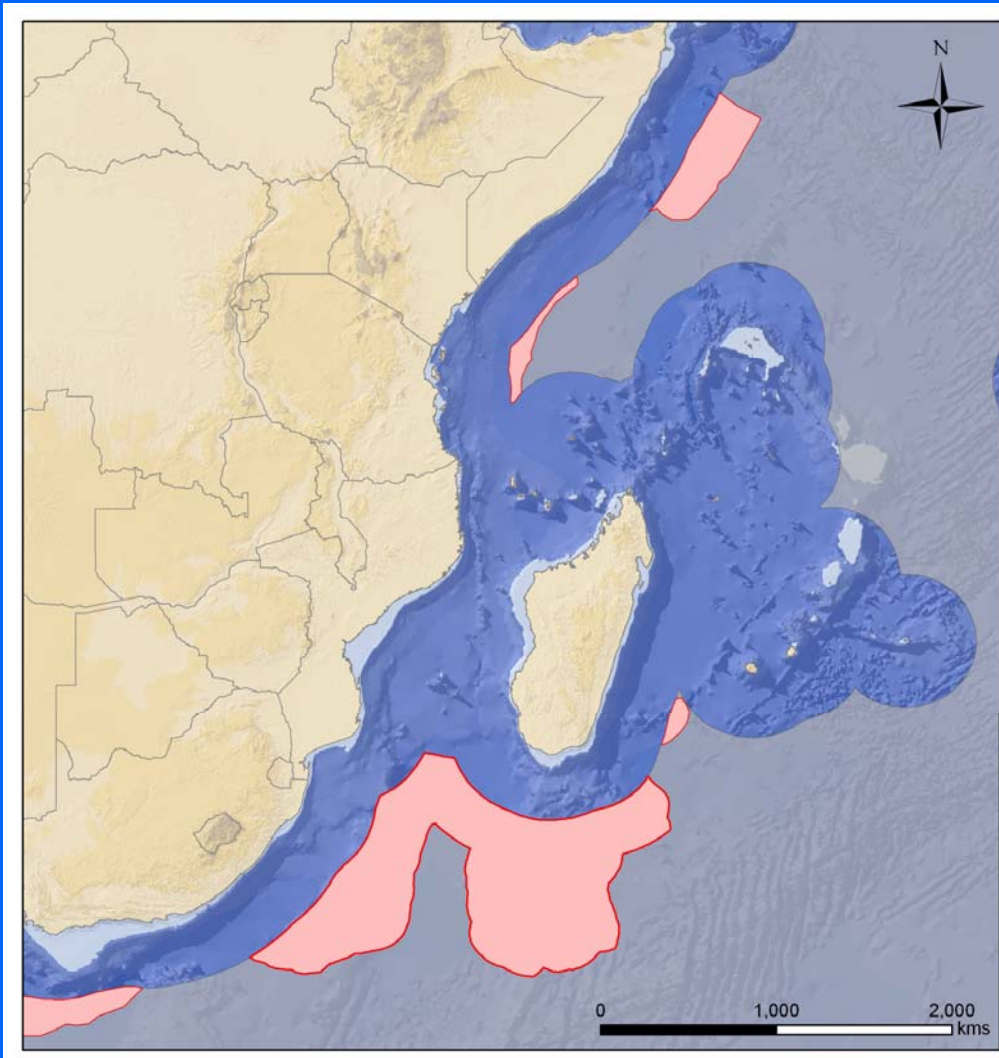




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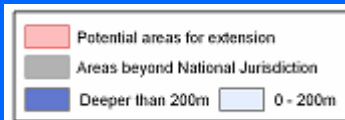
... and this percentage will increase ...



(more about this in the presentation on the UNEP Shelf Programme)

Example:

Deep waters within and beyond areas of national jurisdiction in East Africa

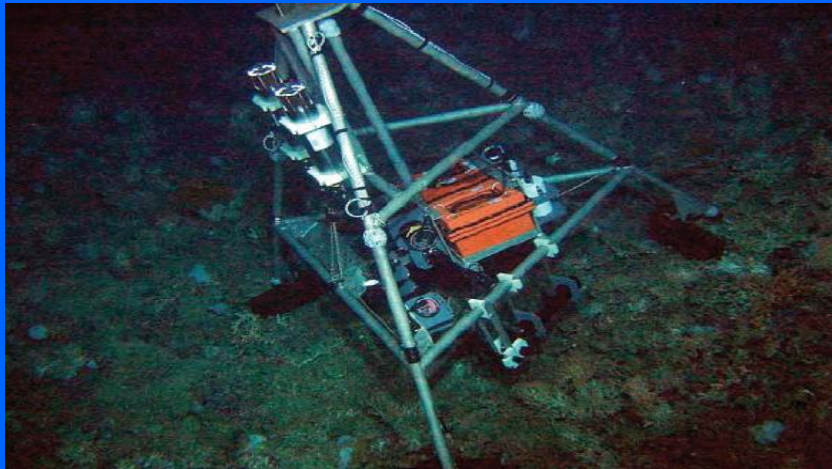




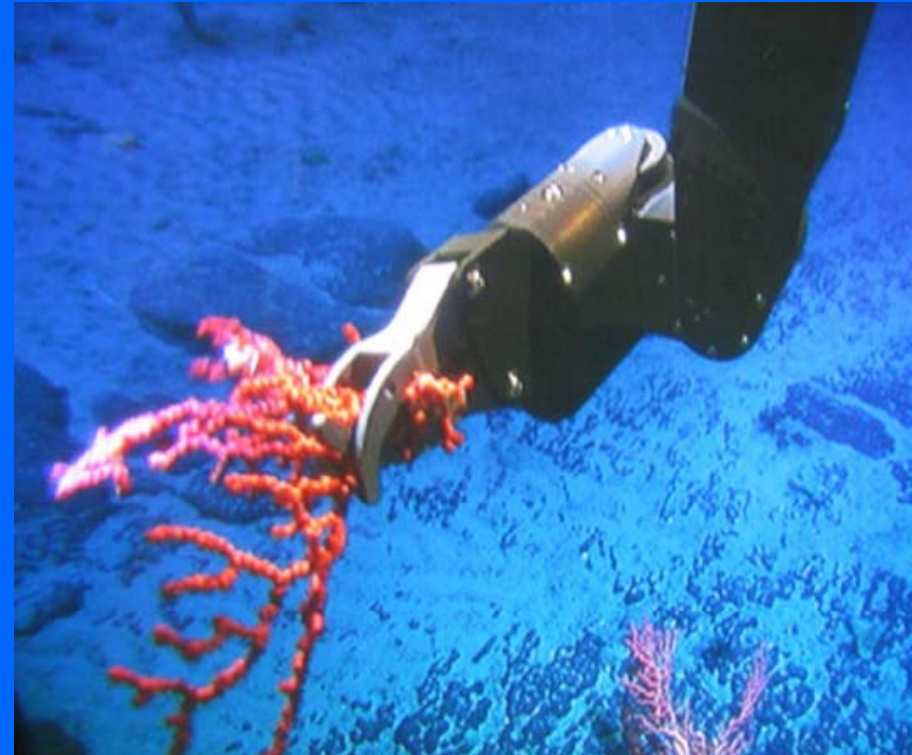
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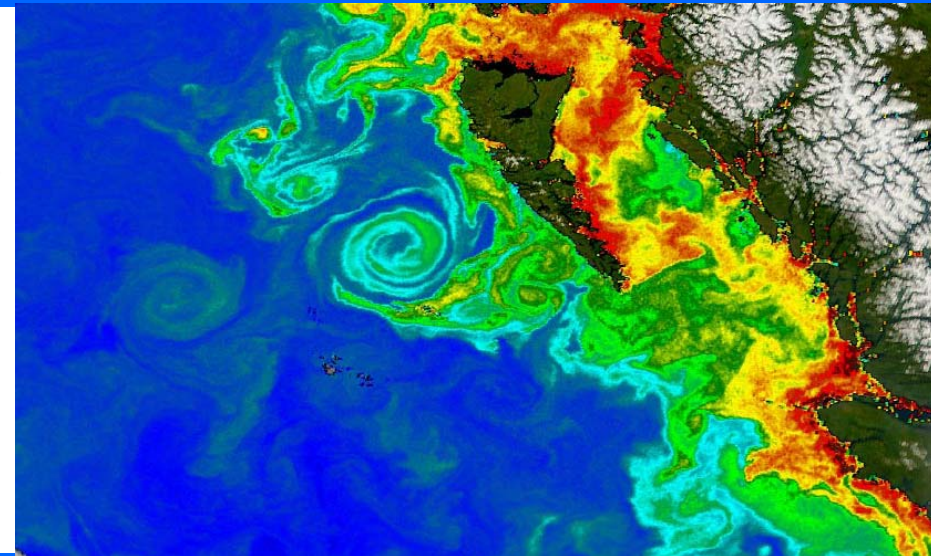
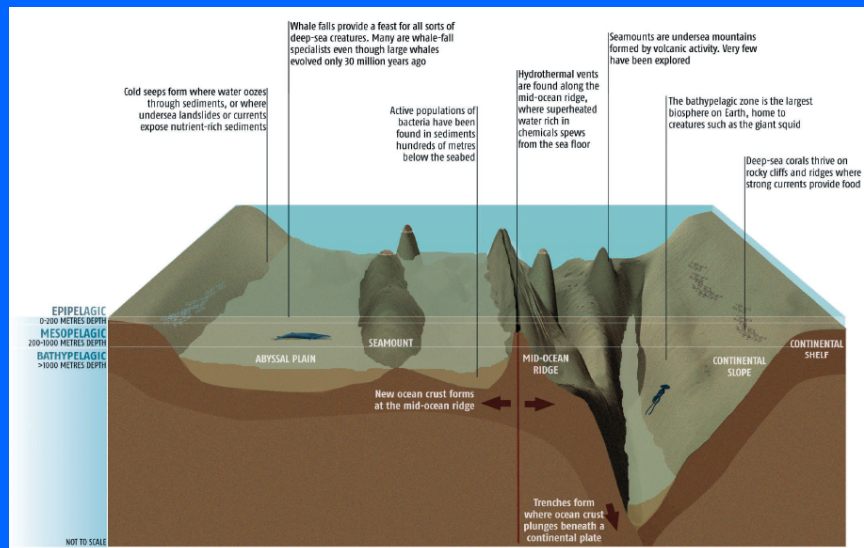
... although 90 of the oceans remain unexplored



Only 0.0001% of the deep seafloor has been scientifically investigated



... we know now that the deep and high seas are highly structured and dynamic ...

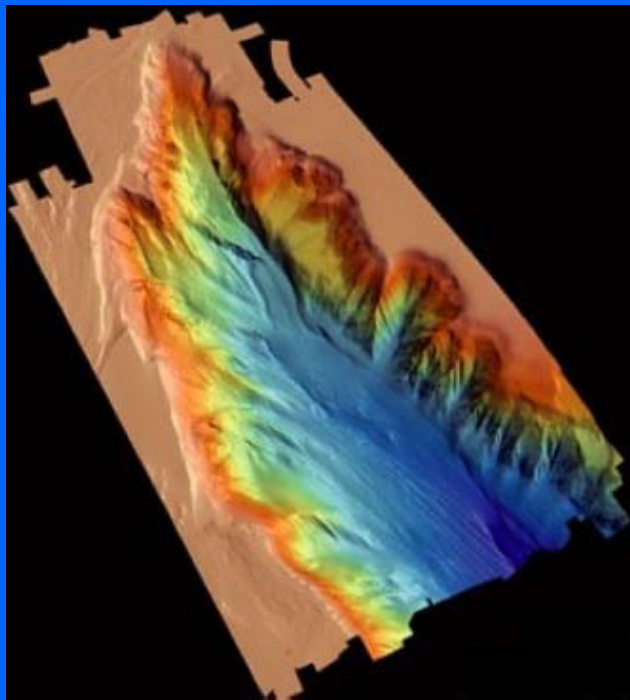




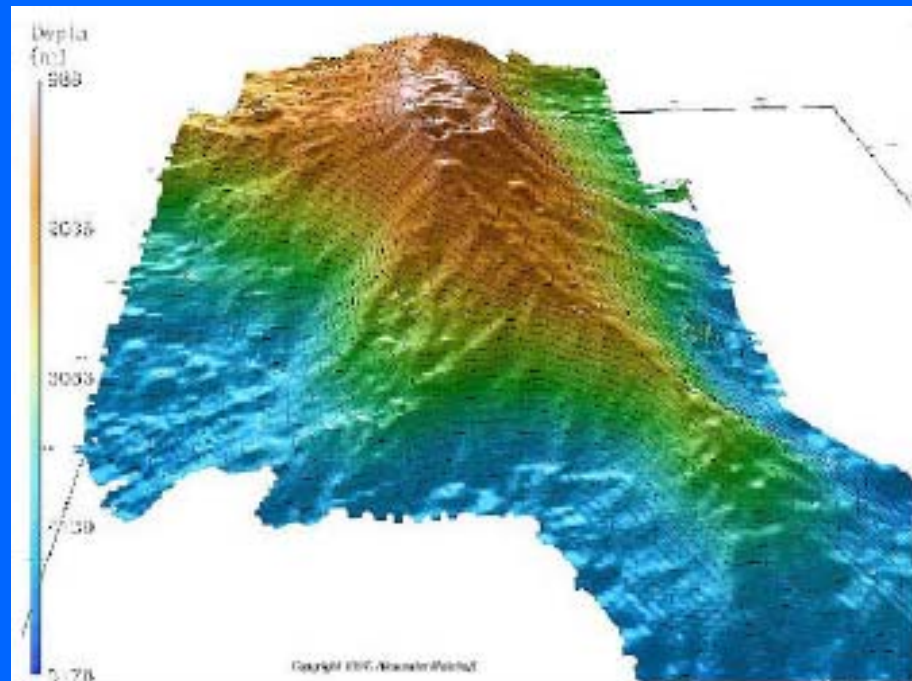
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..... providing a living space that is 168 times larger than terrestrial habitats



canyons



seamounts

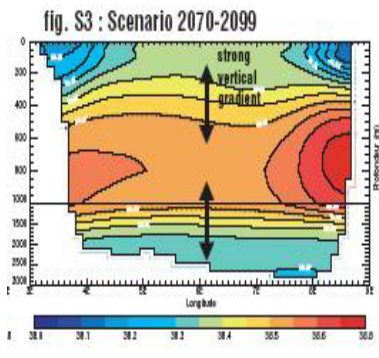
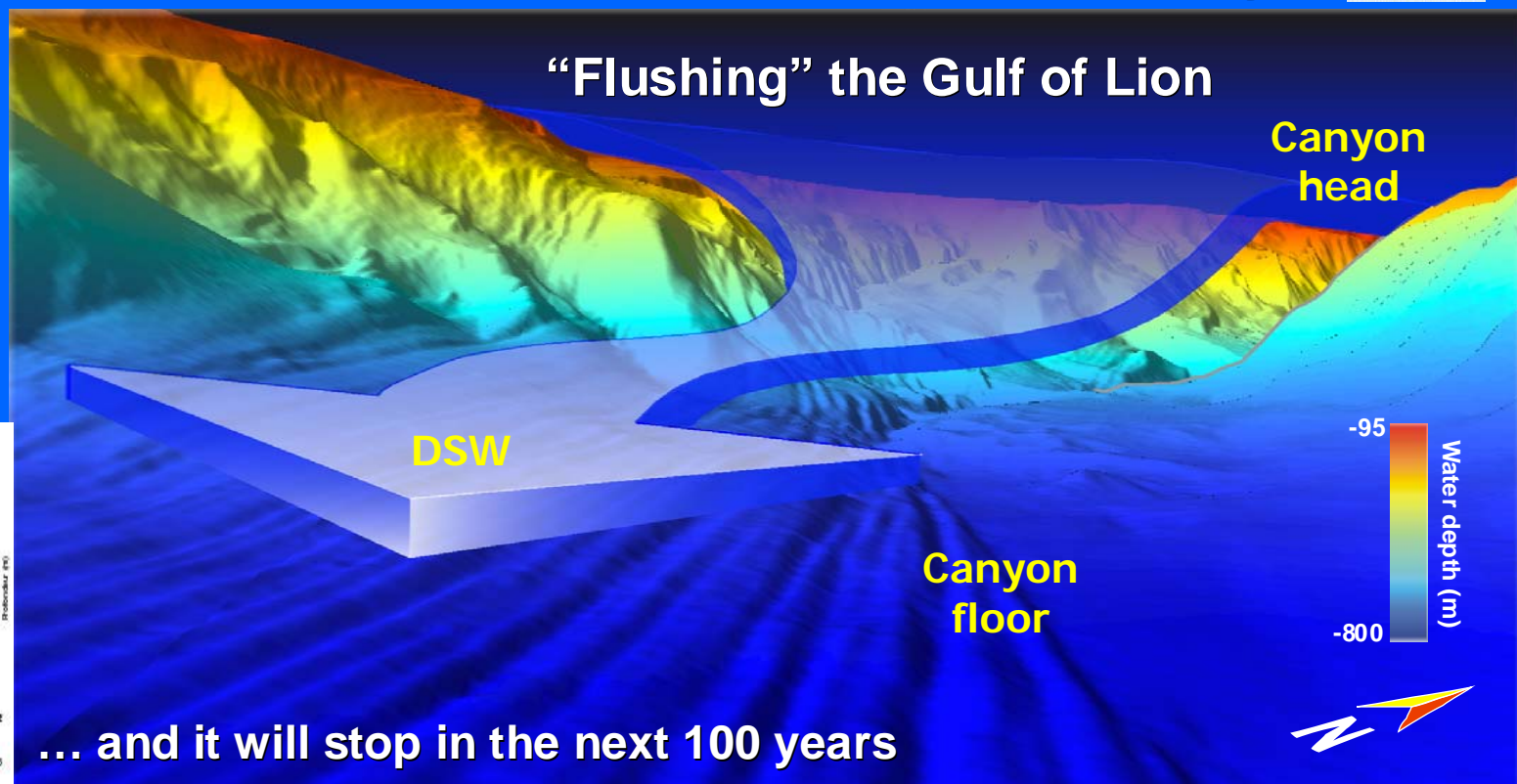


... deep waters are closely connected and linked to coastal, shallow waters ...

Dense Shelf Water (DSW) cascading



In 4 months (Jan-Apr), this process transports more water into the deep sea than:
- 14 years Rhone or
- 2 years discharge of all Mediterranean rivers combined



... and it will stop in the next 100 years

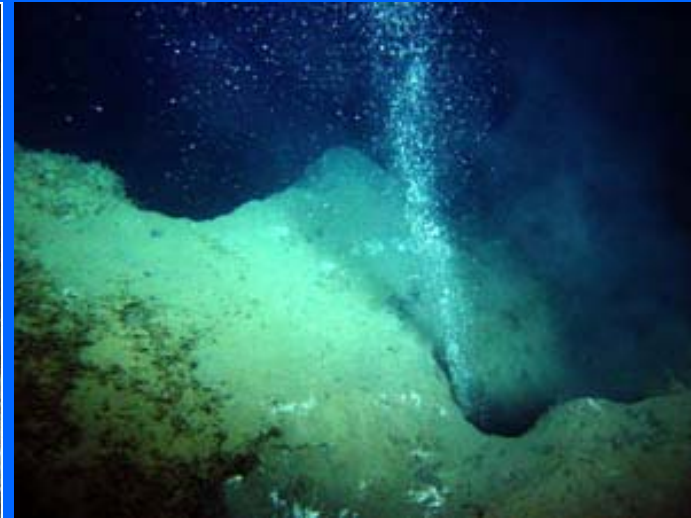


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... home to extraordinary features and unique, vulnerable deep-sea ecosystems and habitats ...

The oceans harbour 90% of the planet's living biomass.





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... and the deep waters are generally teeming with life.

The collage features several images of deep-sea organisms and a central graph. The images include: a red, tangled organism; a pink, spherical organism with circular openings; a yellow, feathery organism; a large, orange, fan-shaped organism; a large, orange, branching organism; a large, blue, spotted fish; a yellow, flat fish; a small, dark fish; a green, branching organism; and a yellow, branching organism.

The central graph plots the Expected Species Number (ES) for 200 samples against Depth (m). The y-axis ranges from 0 to 100, and the x-axis ranges from 0 to 6000. The data points show a peak in species diversity around 2000m depth, followed by a decline. A black curve is fitted to the data points.

Depth (m)	Expected Species Number (ES) (200)
0	10
100	30
200	40
300	50
400	60
500	70
600	80
700	90
800	100
900	100
1000	100
1100	100
1200	100
1300	100
1400	100
1500	100
1600	100
1700	100
1800	100
1900	100
2000	100
2100	100
2200	100
2300	100
2400	100
2500	100
2600	100
2700	100
2800	100
2900	100
3000	100
3100	100
3200	100
3300	100
3400	100
3500	100
3600	100
3700	100
3800	100
3900	100
4000	100
4100	100
4200	100
4300	100
4400	100
4500	100
4600	100
4700	100
4800	100
4900	100
5000	100
5100	100
5200	100
5300	100
5400	100
5500	100
5600	100
5700	100
5800	100
5900	100
6000	100

Deep sea biodiversity and ecosystems provide crucial services ...

Supporting services

- Primary production from chemosynthesis
- Nutrient cycling
- Resilience
- Habitat
- ...

Provisioning services

- Finfish, shellfish, and marine mammals
- Oil, gas and minerals
- Chemical compounds
- Waste disposal sites
- ...

Regulating services

- Gas and climate regulation
- Carbon sequestration and storage
- Waste absorption and detoxification
- Biological control of pests
- ...

Cultural services

- Educational and scientific value
- Aesthetic value
- Spiritual value
- ...



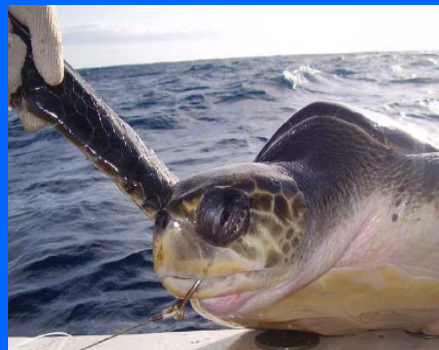


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but the human footprint in the deep sea is expanding ...

from
fishing,
shipping,
pollution,
litter, etc.





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...with proven impacts....

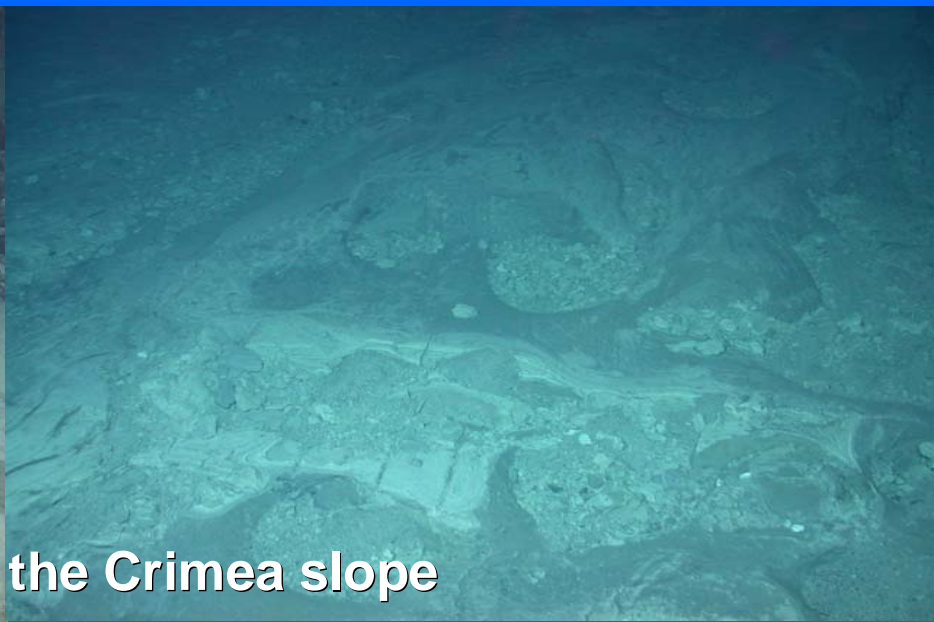
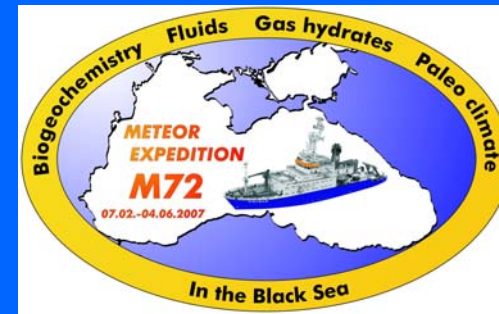




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...causing irreversible loss of biodiversity and ecosystems



Bacterial Reefs on the Crimea slope

On the Crimea slope at around 250 m water depth 3 fields of giant microbial reef structures (the only ones in the world !) have been identified, each between 50-100 m in dimension. Individual structures reach 4 m in height and 1 m in diameter, and take up to 7,000 years to grow. They consist of internally calcified biofilms of microorganisms / bacteria.

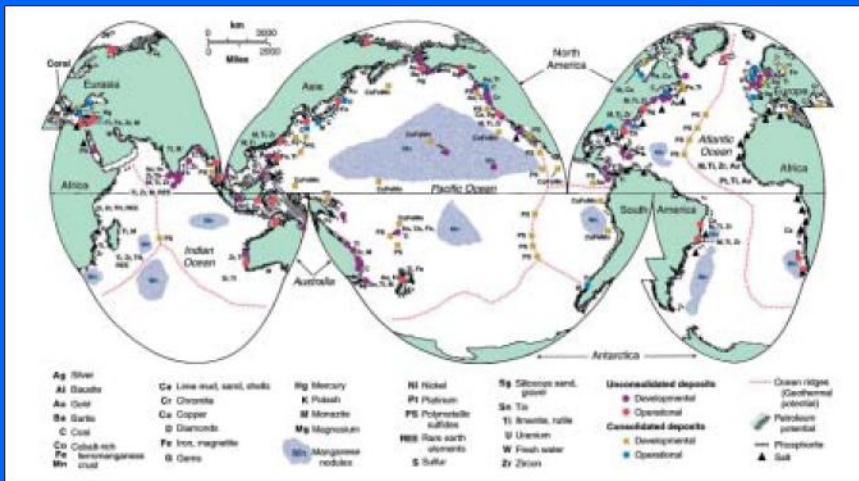
Recent trawling activities have already destroyed a large part of one of these reefs.



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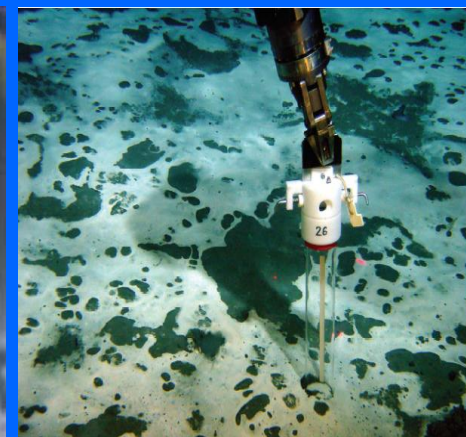
The control and decline of terrestrial and shallow-water resources makes the deep sea interesting for industry ...



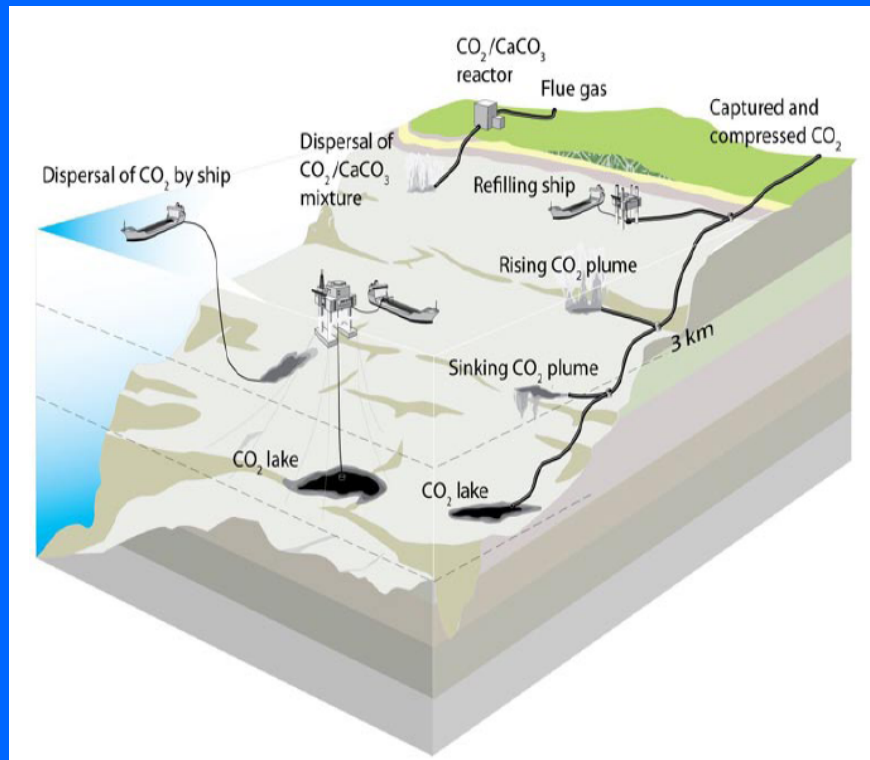
(David Heydon, CEO, Nautilus Minerals)

".. [the] ocean floor [is] the next frontier for mining companies, as land-based areas have been explored to death .."

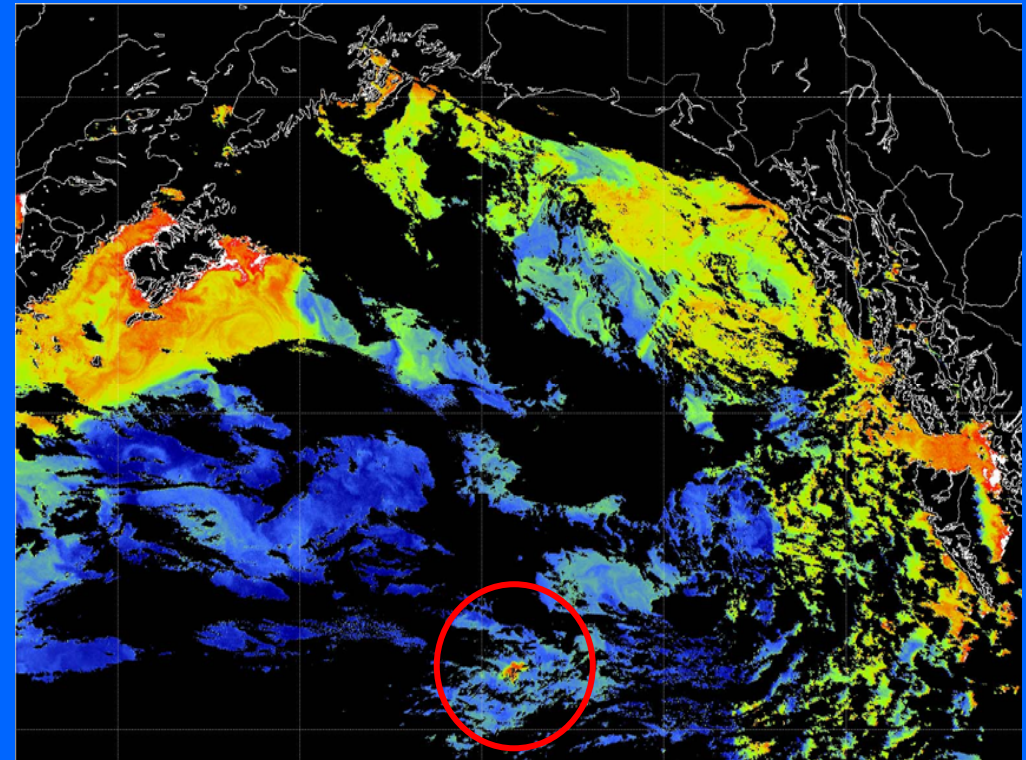
deep-water oil & gas
deep sea mining
cable & pipelines
bioprospecting



... with more and more emerging activities / threats ...



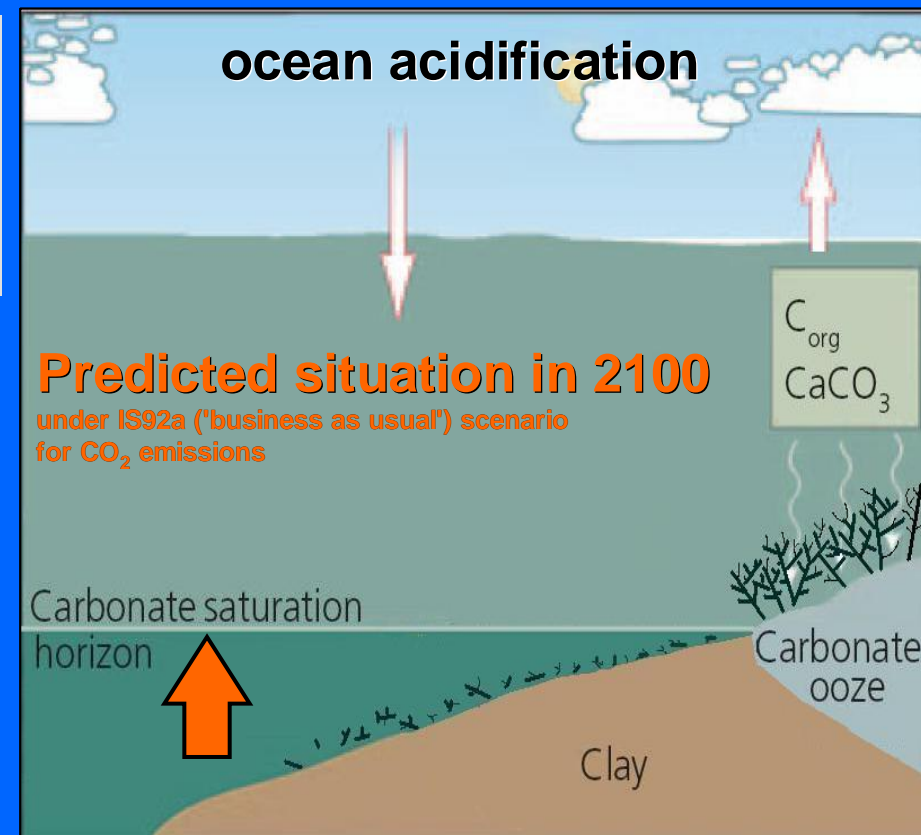
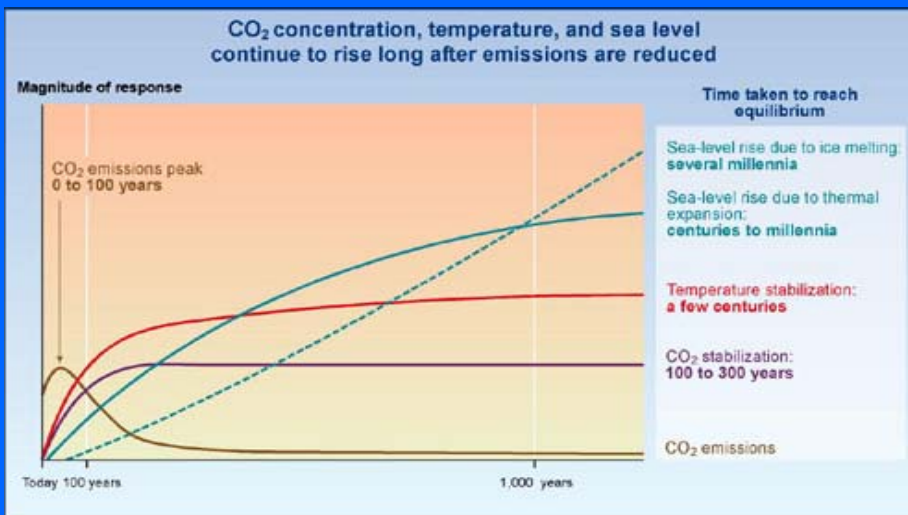
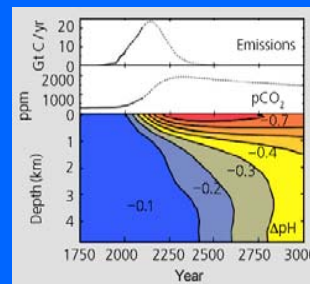
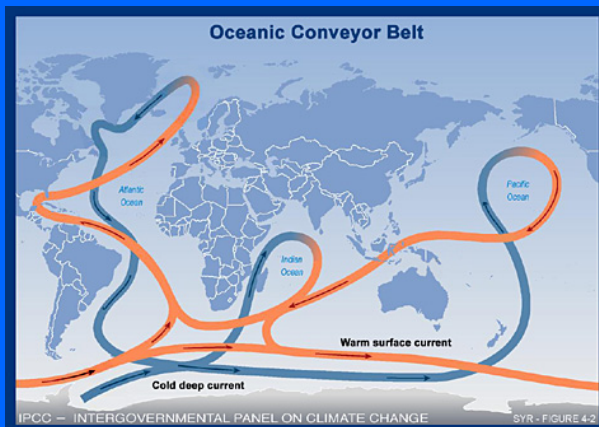
carbon sequestration



ocean fertilisation

...on top of climate change impacts

on ocean circulation, temperatures and chemistry.





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We will not be able to meet international goals, targets and commitments...



WSSD → CBD → OSPAR

2010: biodiversity target
ecosystem approach for oceans
2012: MPA network

Example: Marine Protected Areas

Total number :	~	4200
shallow, coastal waters:	~	4100
deep waters:	~	100
High Sea:	<	10



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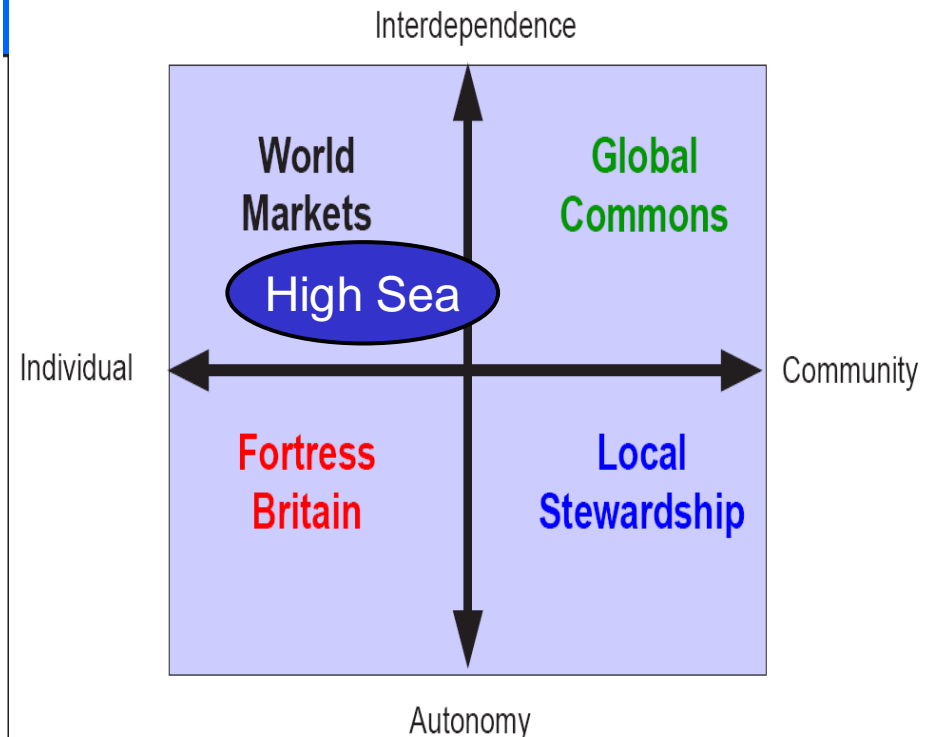
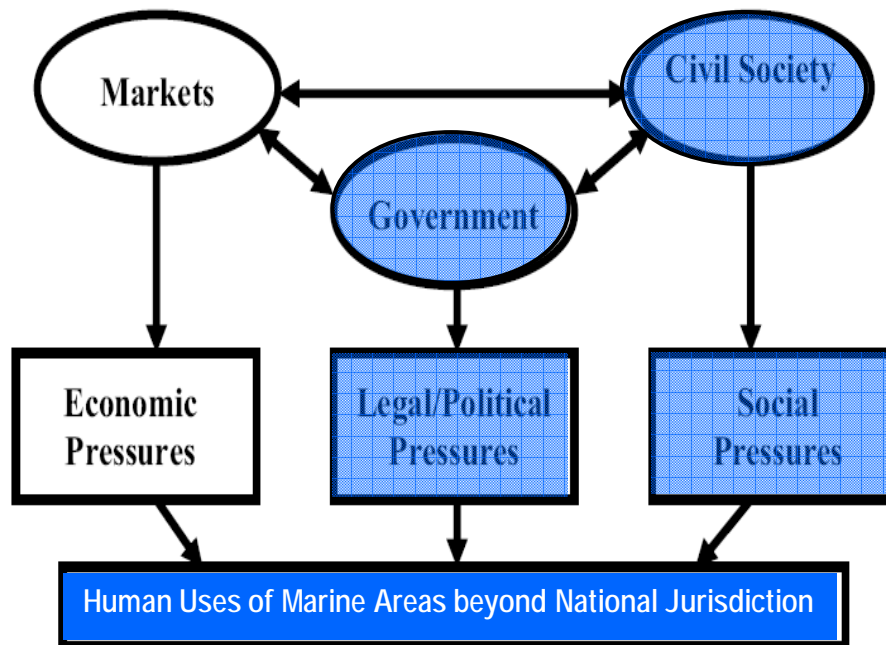


... close the gap in 'High Seas' governance ...



- basic legal framework of UNCLOS not sufficient
- multitude of global / regional key players with limited, fragmented or unclear competence

The 3 key governance mechanisms

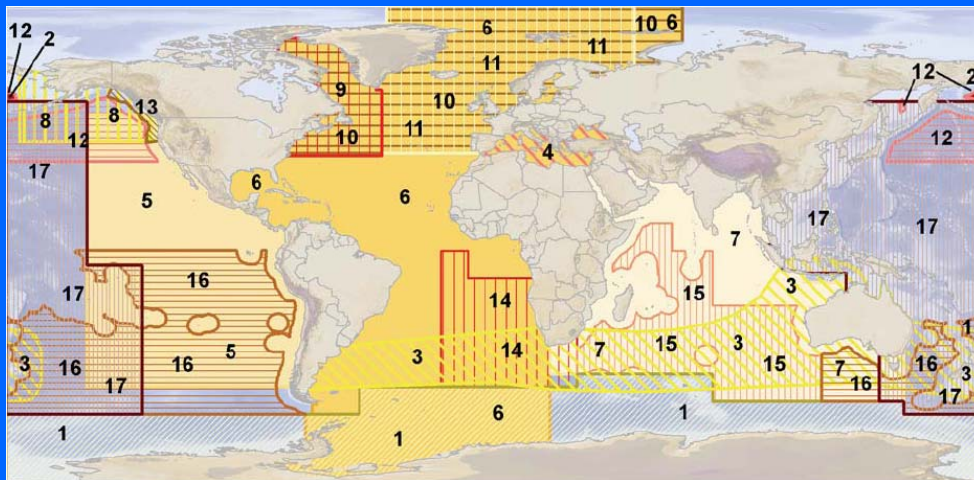




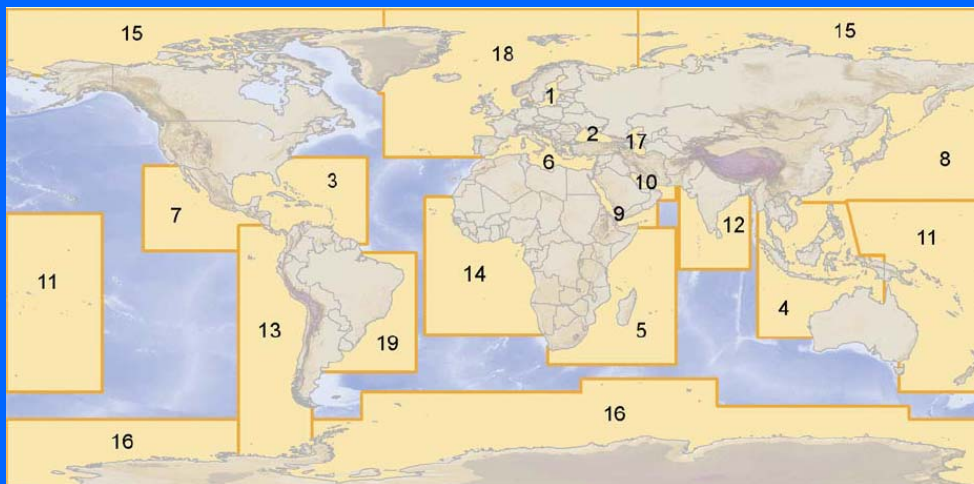
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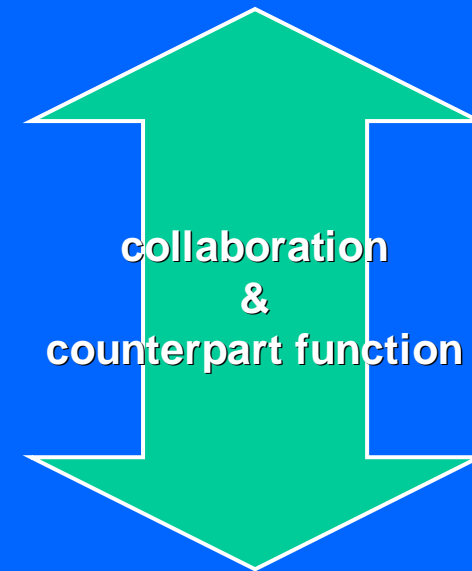
... and achieve ecosystem-based management of the 'High Seas' ...



Regional Fisheries Management Organisations (RFMOs)



Regional Sea Conventions and Action Plans (RSCAPs)





...without immediate action.

Recommendation 1:

Countries and RSCAPs to increase their work on the protection, conservation and sustainable management/use of deep-water biodiversity and ecosystems under their jurisdiction.

Recommendation 2:

RSCAPs to consider extending their scope and mandate to include marine areas beyond national jurisdiction.

Switch from ICZM to IOM (Integrated Ocean Management)