

BLUE AZORES

THE BEST KEPT SECRET
IN THE ATLANTIC

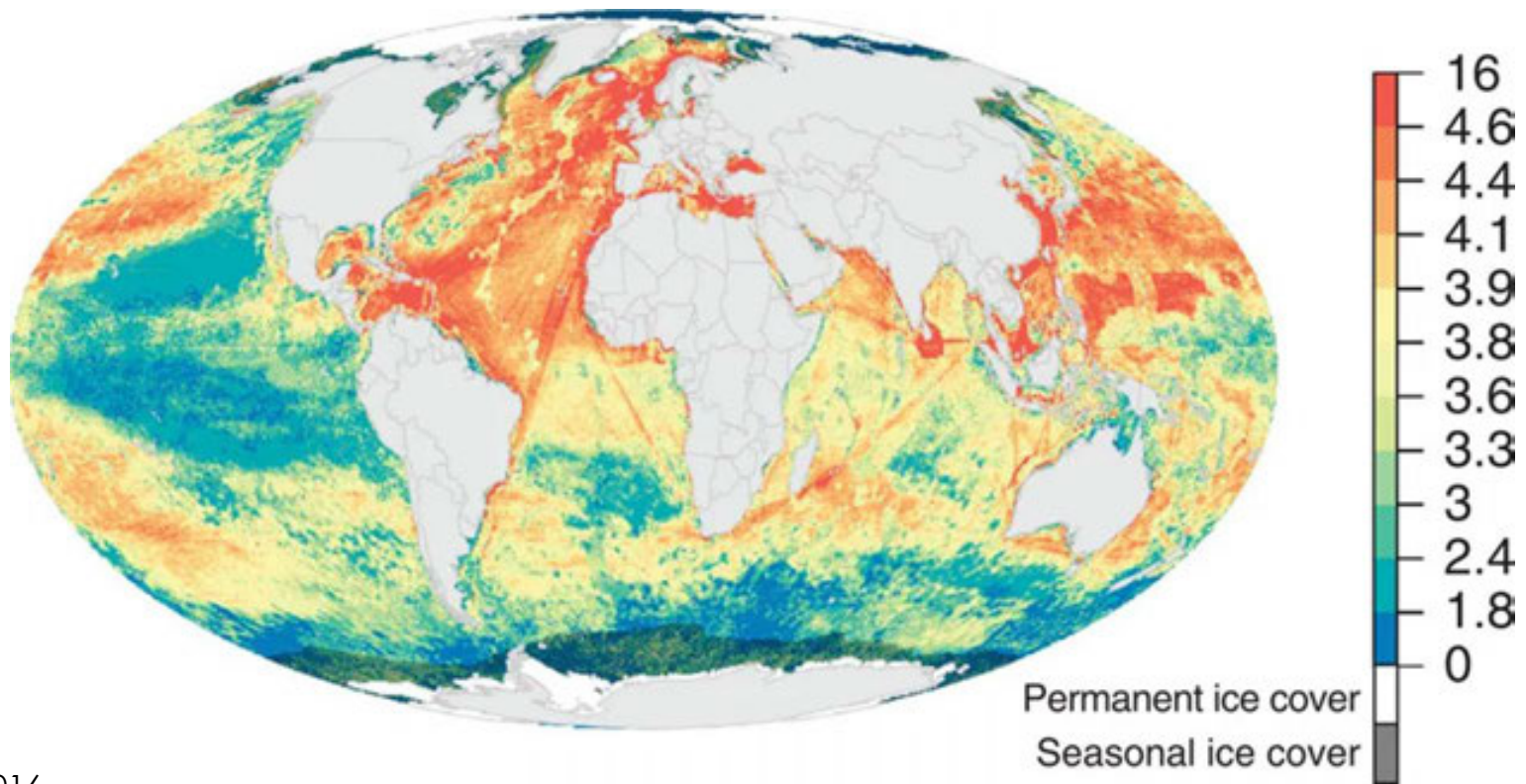


**Friedlander AM, Afonso P, Morato T,
Carreiro-Silva M, Fontes J, Abecasis D.,
Ballesteros E, Botelho AZ., Diaz D, Das D,
Dominguez-Carrió C, Caselle J, Estep A,
Goodell W, Milla D, Ocaña O, Pham C,
Pipa T, Rose P, Salinas de León P,
Schmiing M, Silva C, Taranto G, Tempera
F, Thompson C, Verdura J, Sala E.,
Gonçalves EJ**



GLOBAL HUMAN IMPACTS ON MARINE ECOSYSTEMS

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Halpern et al. 2016

AN OCEAN UNDER THREAT

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Most of Earth's existing biodiversity is marine, but only a small percentage of the ocean is protected.

Overfishing, climate change, pollution and habitat degradation are all threats to marine ecosystems.

***It is urgent to protect the ocean,
before it is too late.***

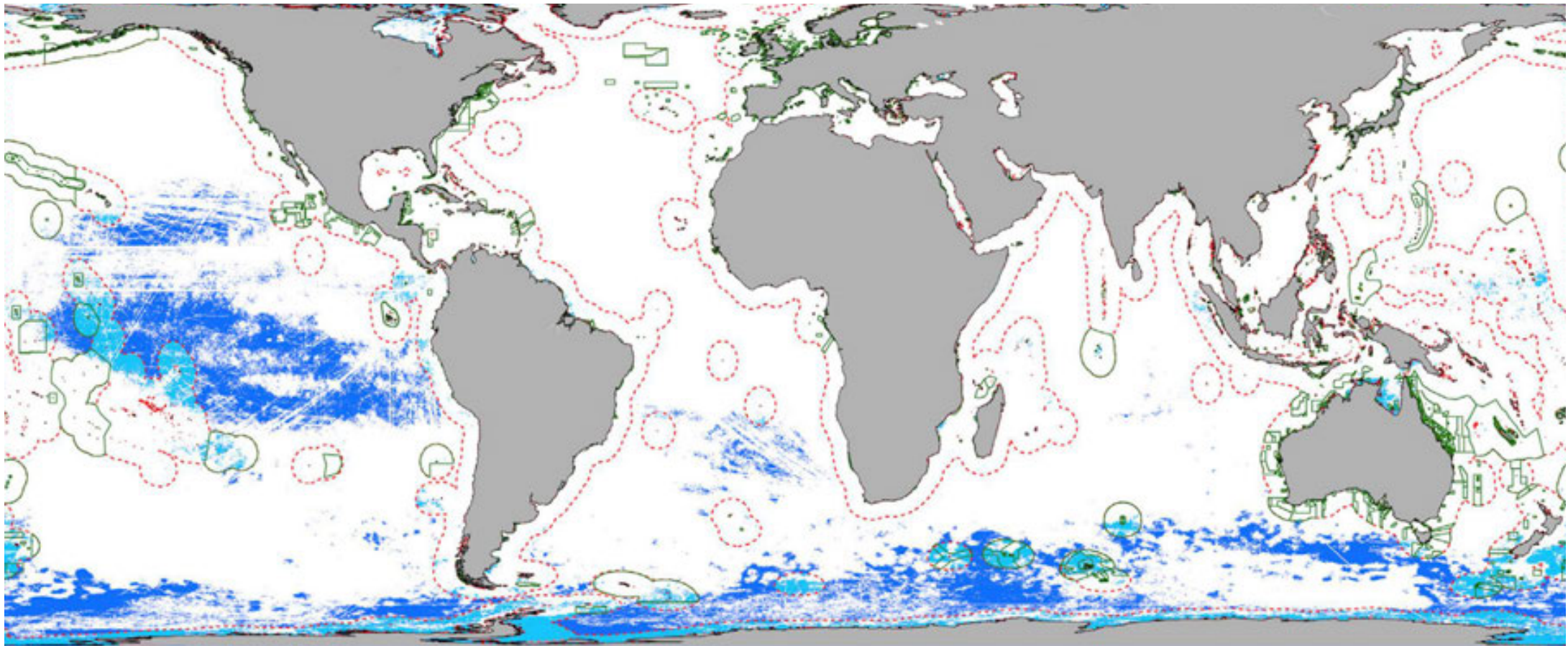


THREE KEY URGENT SOLUTIONS

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1. Save what is left.
2. Rebuild what has been degraded/destroyed.
3. Make sure all activities in the ocean are sustainable.





Light blue Wilderness inside EEZ Dark blue Wilderness outside EEZ Red dashed line Exclusive Economic Zone Green outline 2017 MPAs

Jones et al. 2018, Current Biology

ONLY 13% OF THE OCEAN REMAINS WILD

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Governo dos Açores



OCEANO AZUL
foundation

VAITT
INSTITUTE

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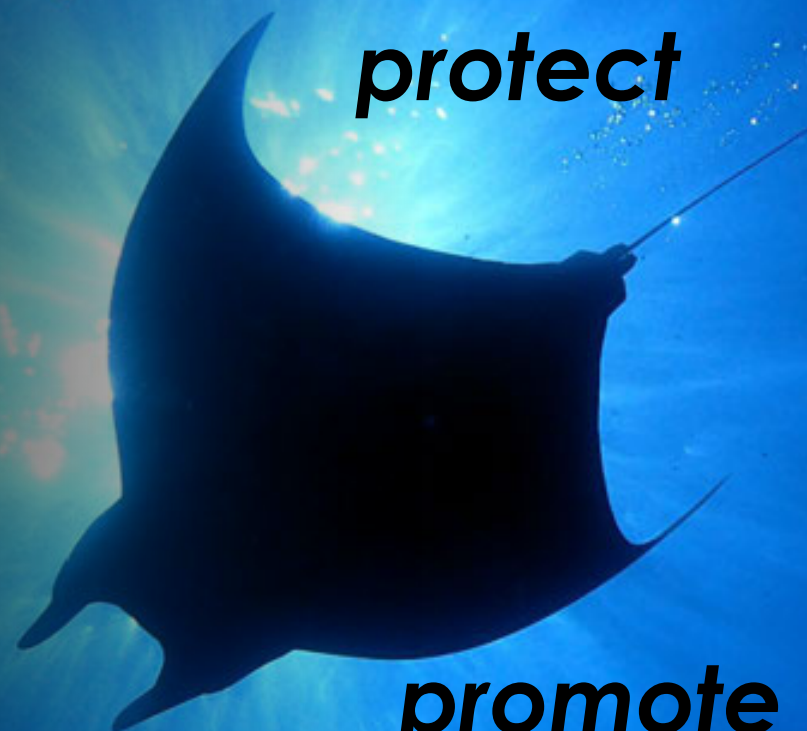


3 PARTNERS
ONE COMMON VISION
THE BLUE NATURAL
CAPITAL
OF THE AZORES

protect

promote

value



THE OCEAN OF THE AZORES

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a unique natural heritage

55% of the Portuguese ocean territory (EEZ)

~1 million km²

3000 m average depth

5% of the maritime territory of the Azores is protected



THE OCEAN OF THE AZORES

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a unique natural heritage

Hydrothermal vent fields

25 species of **marine mammals**

4 species of **sea turtles**

560 species of **fish**

8 species of **nesting seabirds**

> 400 species of **algae**

Thousands of **invertebrates**



THE OCEAN OF THE AZORES

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a unique natural heritage

Many economic sectors of the Azores depend on marine resources that are under great pressure.

It is critical to develop a **blue economy** that protects natural values, ensuring the sustainable use of marine resources alongside promoting **economic growth**, improving the **quality of life** of the Azorean people, and generating new **opportunities for employment**.



OBJECTIVES

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Declare **15% of EEZ** of the Azores as new fully protected Marine Protected Areas (MPAs);

Develop **management plans** for new and existing MPAs;

Develop a **marine spatial plan**;

Improve **fisheries management**;

Implement **Blue Generation** & **Blue Bio Value** programs in the Region.

PLAN OF ACTION



TIMELINE

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2019

2020

2021

2022

2023

2024

Legal designation of **15% of new marine protected areas**

Marine Spatial Plan approved

Management plans for all existing marine protected areas

Actions to **improve fisheries management**

Implementation





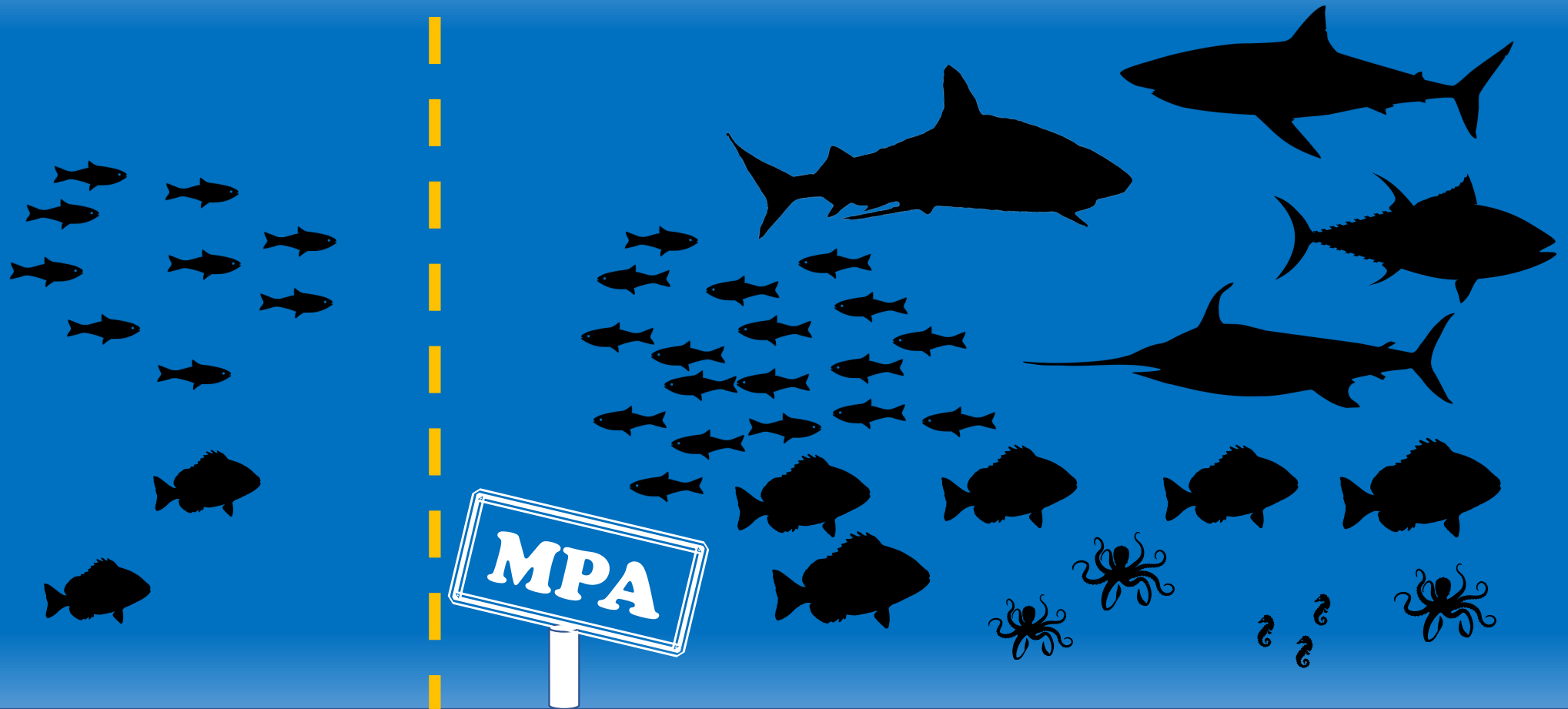
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15%

FULLY PROTECTED MPAs

150.000 km²

MARINE PROTECTION WORKS

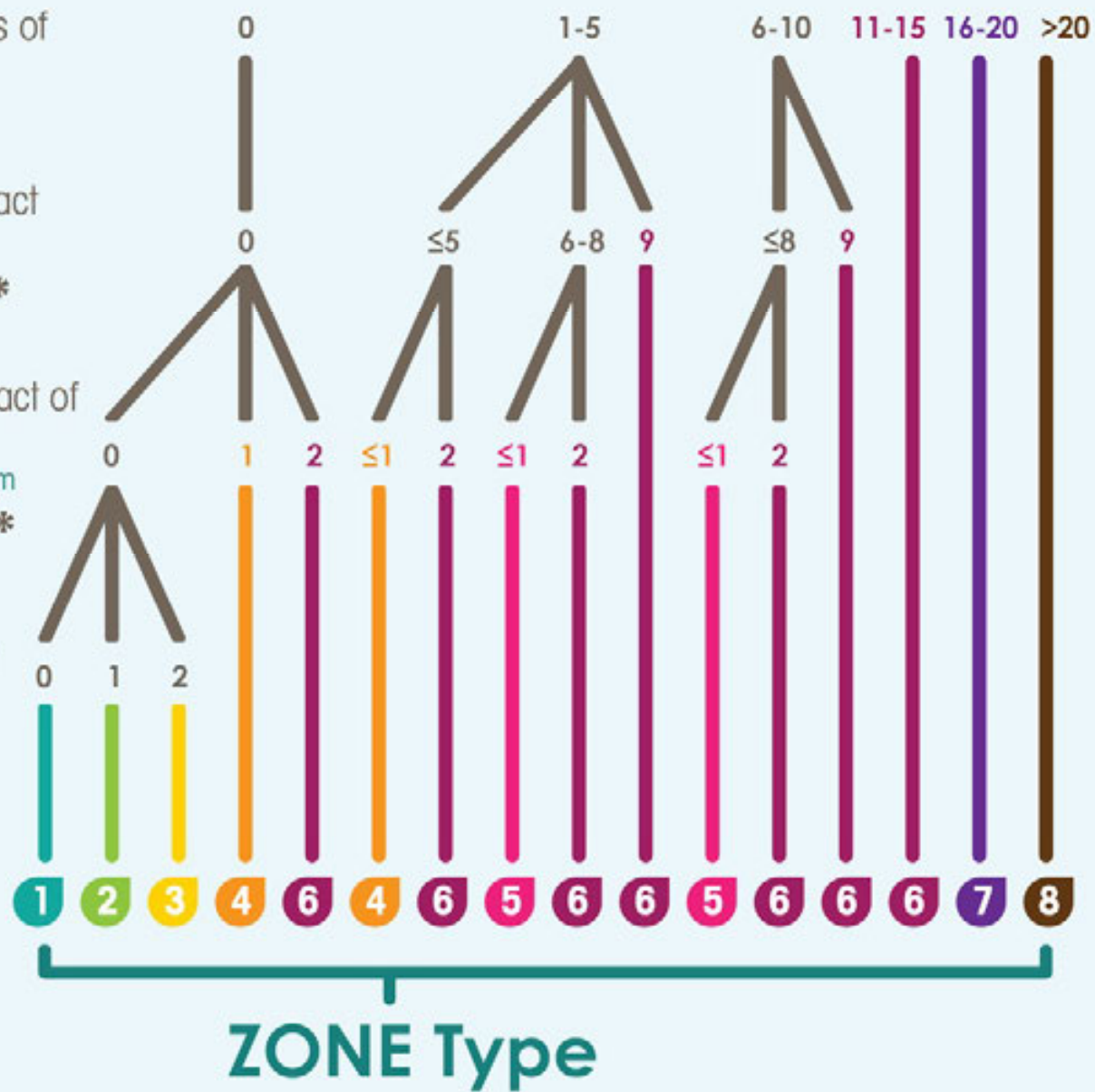


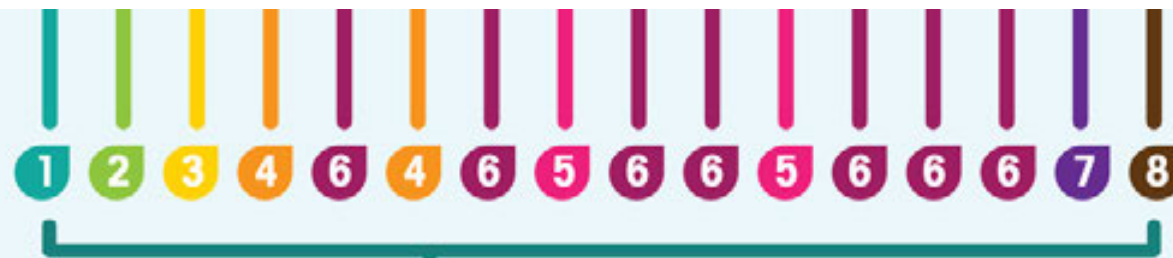
How many types of fishing gear?

What is the impact of fishing gear?
(highest gear score) *

What is the impact of other activities?
(aquaculture or bottom exploitation index) **

Anchoring and/or boating?
(anchoring/boating index) ***





ZONE Classification

- | | |
|-------------------------------|------------------------------------|
| 1 No-take/No-go | 5 Moderately regulated extraction |
| 2 No-take/Regulated access | 6 Weakly regulated extraction |
| 3 No-take/Unregulated access | 7 Very weakly regulated extraction |
| 4 Highly regulated extraction | 8 Unregulated extraction |

ZONE Type



Next stage: how to classify MPAs

An MPA index is calculated based on the area each ZONE type occupies within the MPA

$$\text{MPA index} = \text{SUM} \left(\text{ZONE}_i \text{ Type} \times \frac{\text{Area ZONE}_i}{\text{Area MPA}} \right)$$

Example of a multiple-use MPA with 3 zones (and corresponding zone types) occupying different areas



EXAMPLE

MPA with 100 ha of total area

15ha type 1 + 35ha type 5 + 50ha type 8

$$\text{MPA index} = \left(1 \times \frac{15}{100}\right) + \left(5 \times \frac{35}{100}\right) + \left(8 \times \frac{50}{100}\right) = 5.9$$

(MPA index highly correlated to the MPA score: Spearman $\rho = 0.88$; $p < 0.001$)

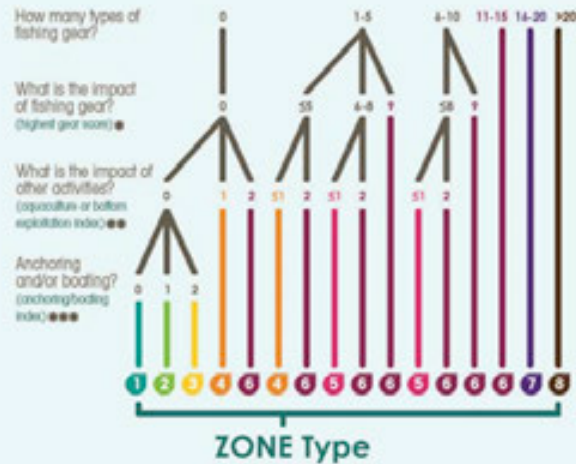
MPA index

MPA Classification

1 to 3 <i>incl.</i>		FULLY PROTECTED AREA
3 to 5 <i>incl.</i>		HIGHLY PROTECTED AREA
5 to 6 <i>incl.</i>		MODERATELY PROTECTED AREA
6 to 7 <i>incl.</i>		POORLY PROTECTED AREA
7 to 8		UNPROTECTED AREA

A Regulation-Based Classification System for Marine Protected Areas (MPAs)

Classification System of Zones within MPAs (a decision tree)



- ### ZONE Classification
- 1 No-take/No-go
 - 2 No-take/Regulated access
 - 3 No-take/Unregulated access
 - 4 Highly regulated extraction
 - 5 Moderately regulated extraction
 - 6 Weakly regulated extraction
 - 7 Very weakly regulated extraction
 - 8 Unregulated extraction

A Regulation-Based Classification System for Marine Protected Areas (MPAs)

Classification System of MPAs



Next stage: how to classify MPAs
 (MPA Index is calculated based on the area each ZONE type occupies within the MPA)

$$\text{MPA Index} = \text{SUM} \left(\text{ZONE}_i \text{ Type} \times \frac{\text{Area ZONE}_i}{\text{Area MPA}} \right)$$



MPA Index	MPA Classification
1 to 3	FULLY PROTECTED AREA
3 to 5	HIGHLY PROTECTED AREA
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6 to 7	POORLY PROTECTED AREA
7 to 8	UNPROTECTED AREA

Regulation-Based Classification System for Marine Protected Areas (MPAs)

Index (supporting information for the decision tree)

g gear score

gear score	or (commercial or all)	Gear score
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8

Impact of other activities or bottom exploitation index

Index
1
2
3
4
5
6
7
8

Anchoring/boating index

Activities allowed	Index
No anchoring	1
Anchor landing equipment allowed but anchoring is fully regulated according to protection	2
Anchor landing equipment allowed but anchoring is not regulated according to protection	3
Anchor landing equipment allowed but anchoring is not regulated according to protection	4
Anchor landing equipment allowed but anchoring is not regulated according to protection	5
Anchor landing equipment allowed but anchoring is not regulated according to protection	6
Anchor landing equipment allowed but anchoring is not regulated according to protection	7
Anchor landing equipment allowed but anchoring is not regulated according to protection	8

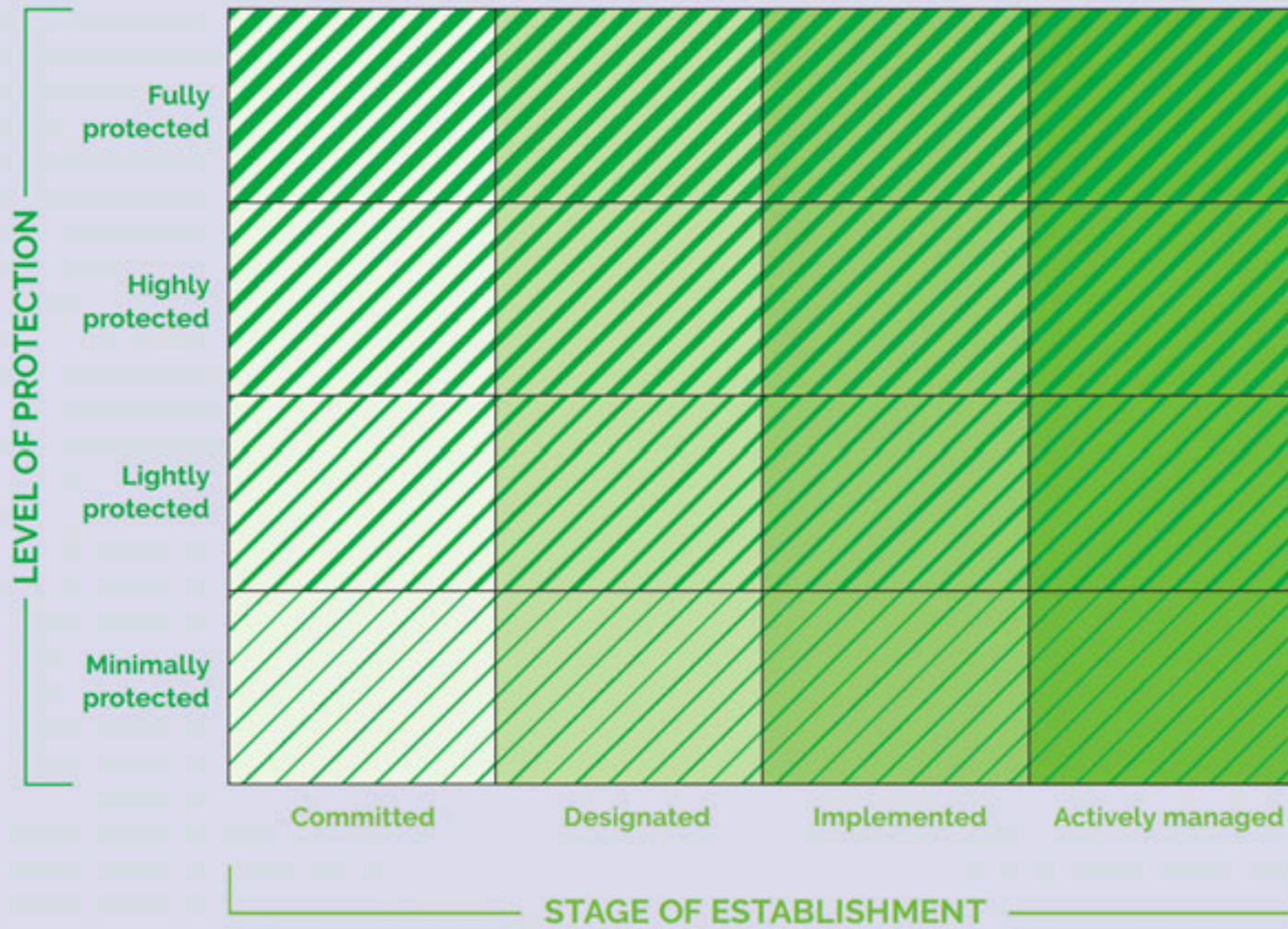


Momentum to protect the global ocean and to use Marine Protected Areas (MPAs) as a conservation tool is greater than it has ever been. But realizing the potential will require a common, shared language to understand, celebrate and track achievements and provide clarity about our collective, science-based goal.

AN INTRODUCTION TO THE MPA GUIDE

- Conserving biodiversity in the global ocean
- Reflecting shared goals by refining shared language

THE MPA GUIDE



**OCEANO
AZUL
EXPEDITION**



2016
Plan B



2018
Santa Maria Manuela



2018
NRP Almirante Gago Coutinho



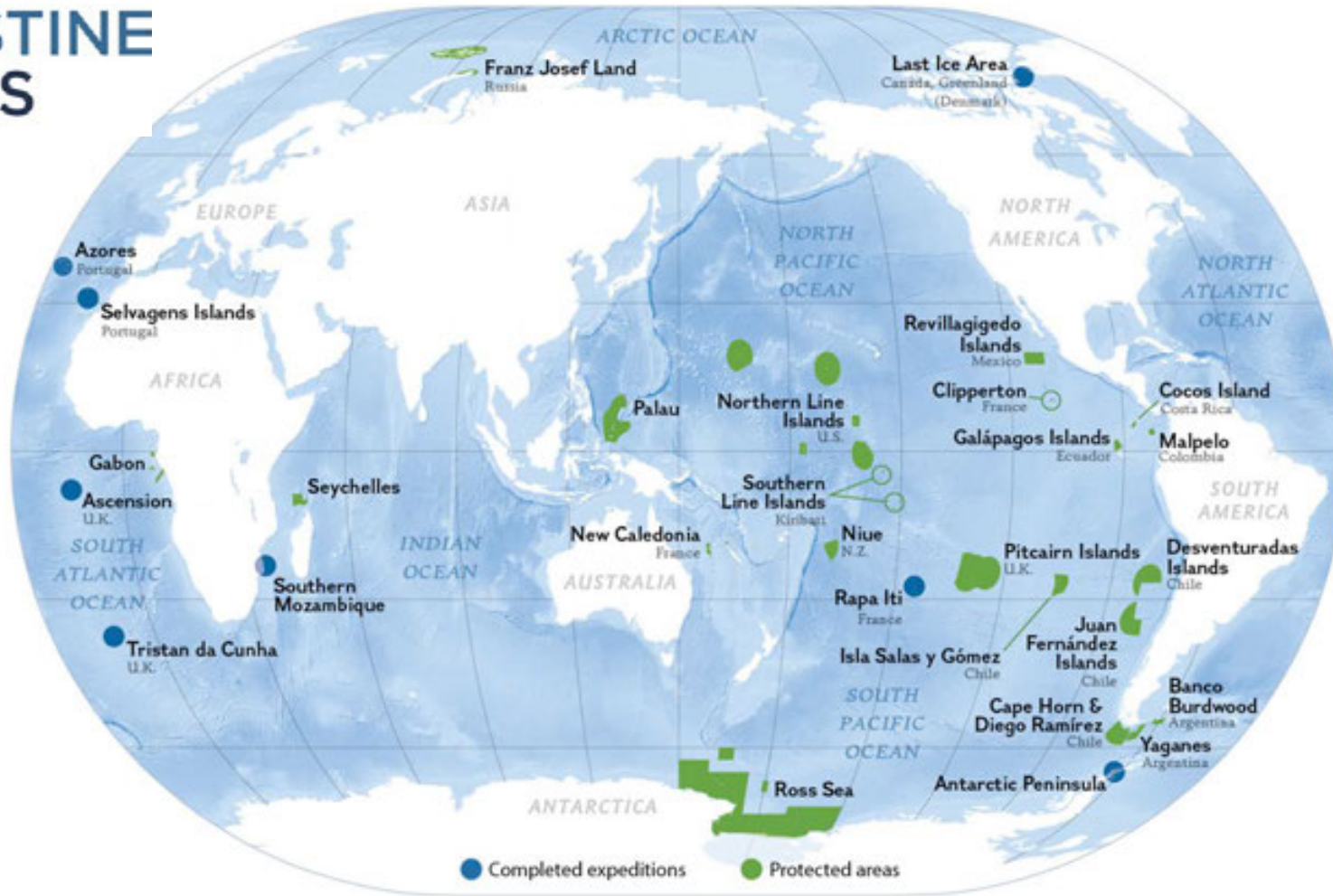
2018
RV L'Atalante



NATIONAL GEOGRAPHIC

PRISTINE SEAS

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2016:

- 10 researchers
- 16 participants
- > 350 dives and
> 450 hours spent underwater
- > 278 kilometres travelled
- 75 survey sites
- 46 live-feed cameras



2018:

- 38 researchers
- 96 participants
- > 600 dives and
> 500 hours spent underwater
- 1203 kilometres travelled
- 21.469 km² of newly mapped sea floor
- 60 hours ROV Luso in 13 dives
- 107 survey sites
- 39 successful deep dropcam deployments
(300 to 1500 m)
- 155 open ocean camera deployments
- 76 nearshore cameras
- 48 live-feed cameras
- 737 students enrolled in the Open Explorer
Classroom from eight countries

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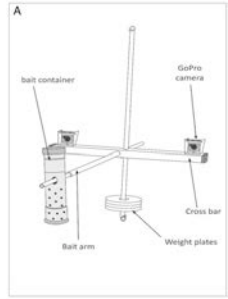
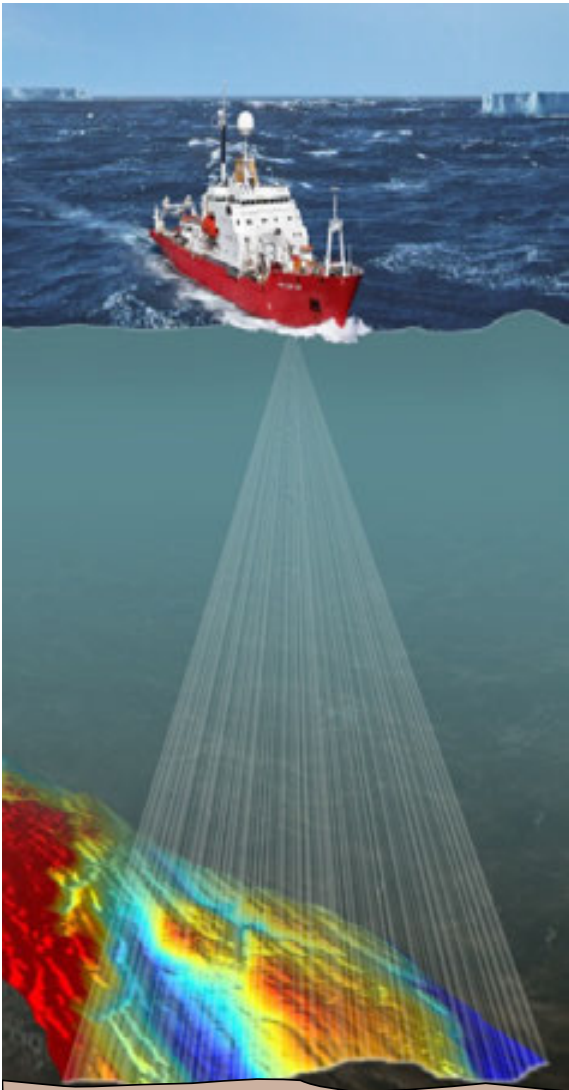


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737 students
enrolled in the
Open Explorer Classroom
from eight countries

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Open water cameras



Manta sat tags

SCUBA



0 - 30 m

Remote Cameras



50-100 m

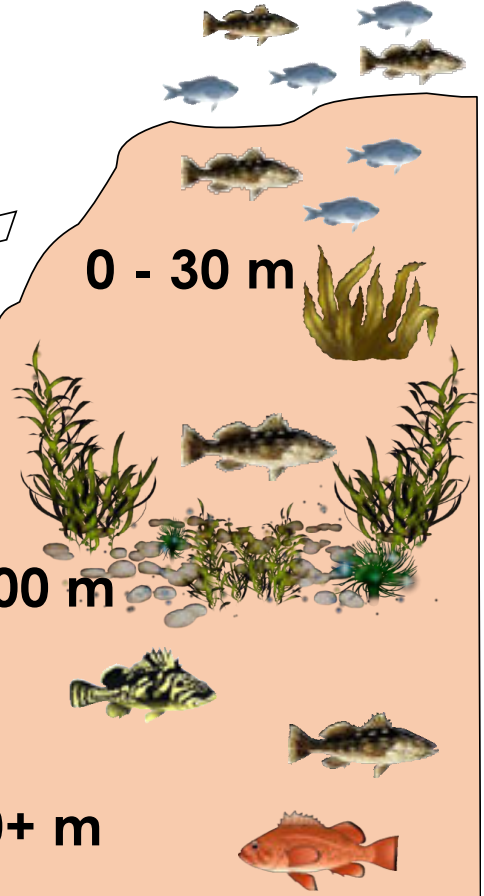


ROV



Deep-water drop cameras

100 - 1500+ m



INTERDIAL COMMUNITIES

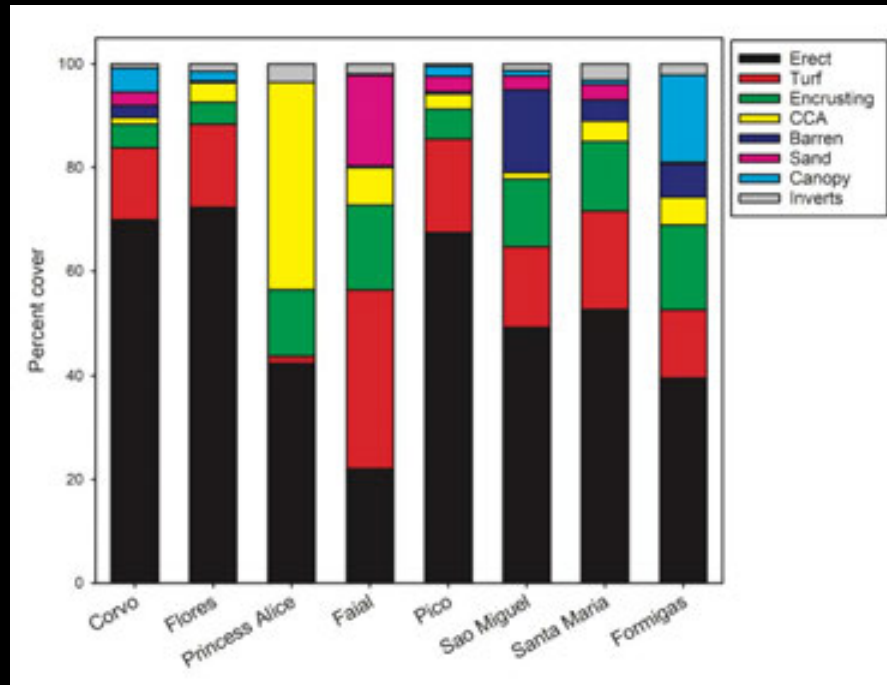
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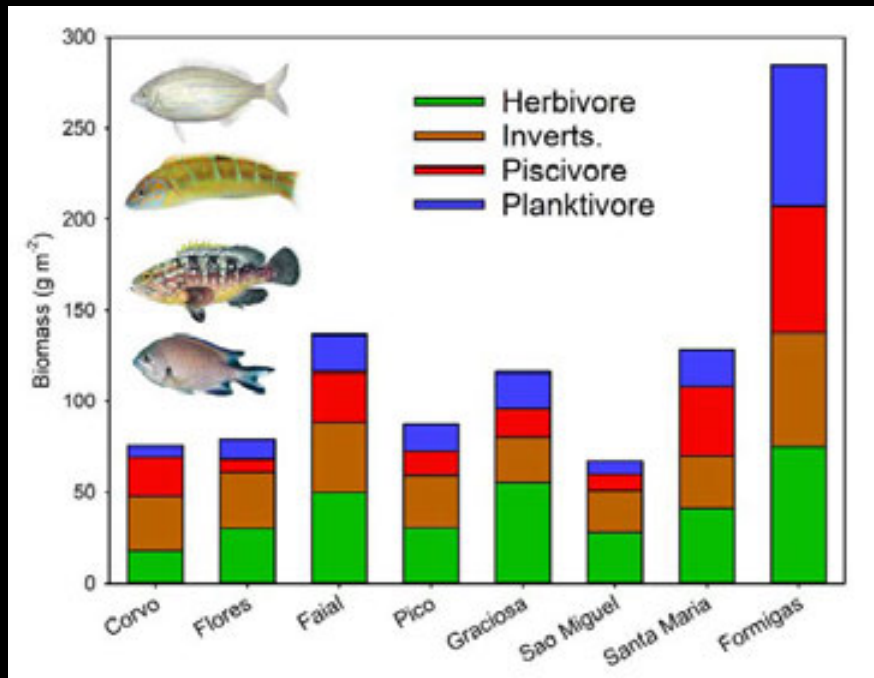
NEARSHORE BOTTOM COMMUNITIES

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COASTAL FISH ASSEMBLAGES

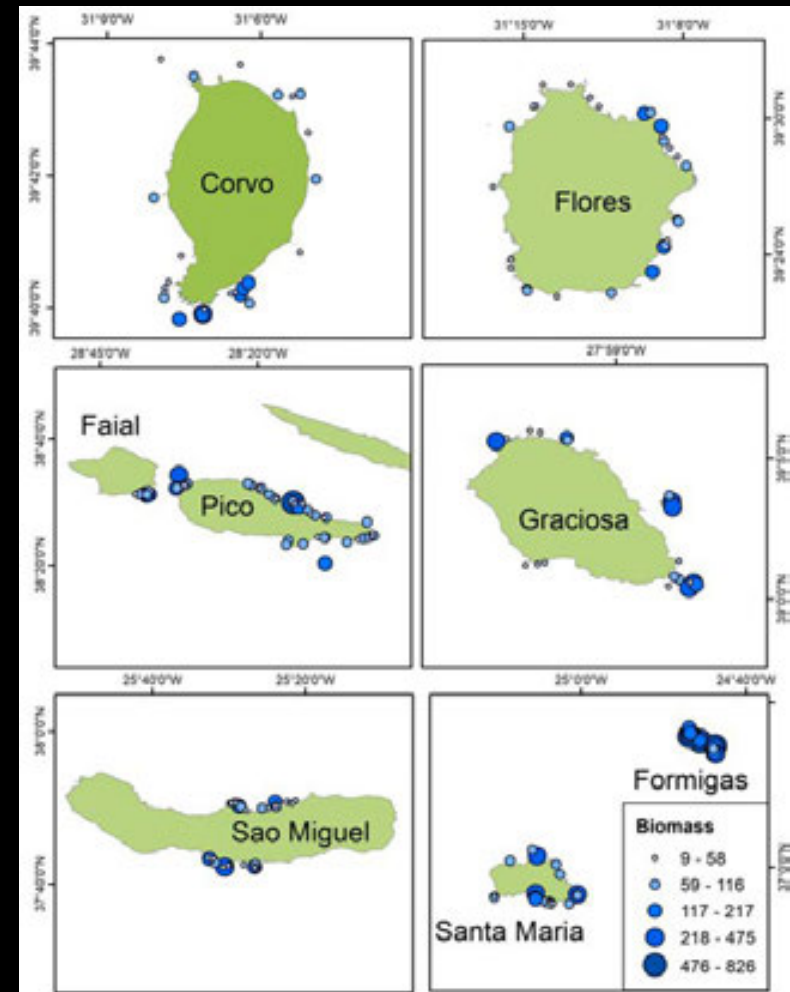
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COASTAL REEFS AND SEAMOUNTS

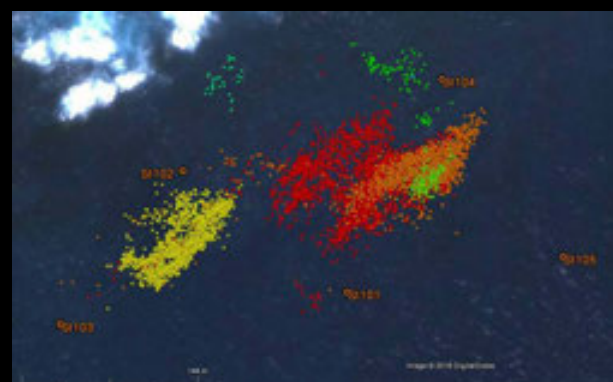


FISH ASSEMBLAGES



DUSKY GROUPER ACOUSTIC TELEMETRY

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NEARSHORE SHARK NURSERIES

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08/26/2018 18:31:43

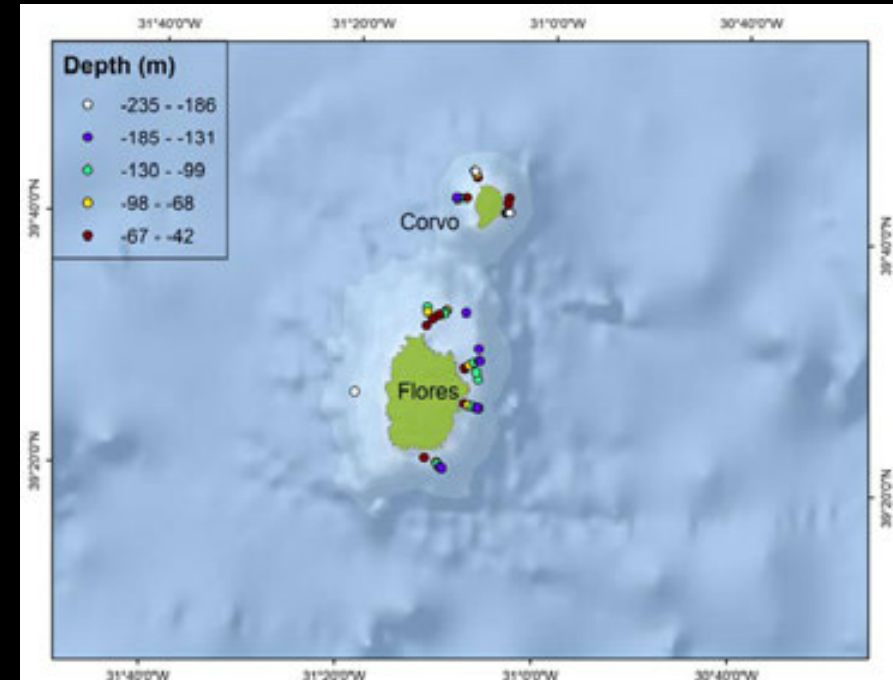
OPEN WATER SHARK NURSERIES

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DEEPWATER REEFS (50-170 M)

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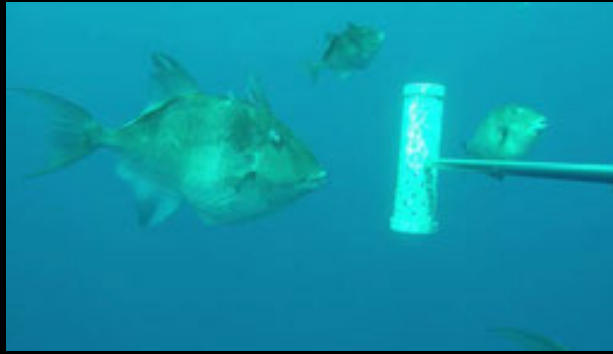
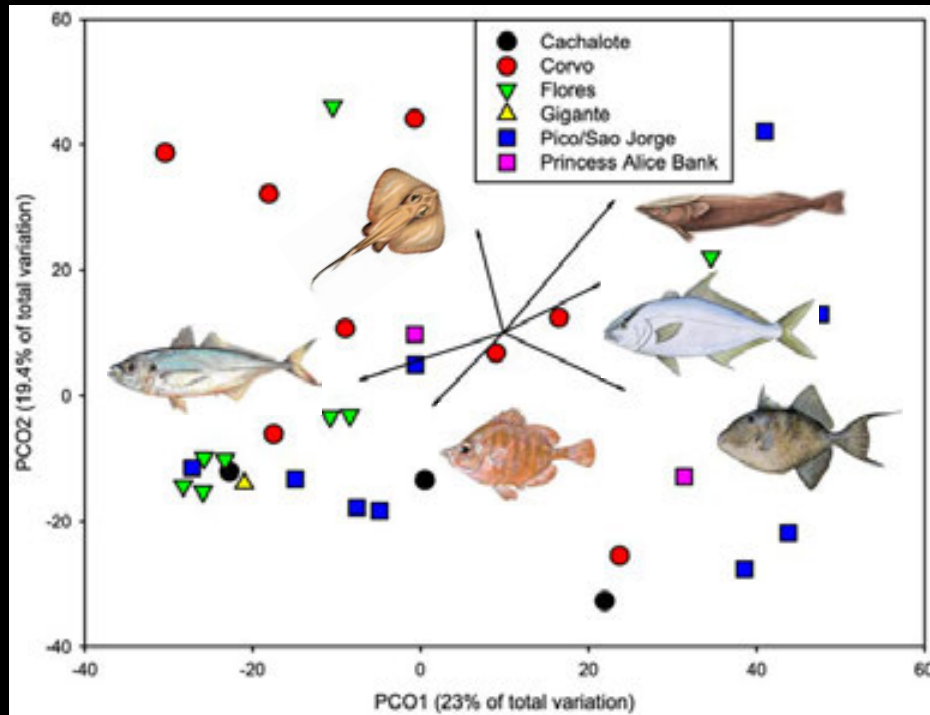


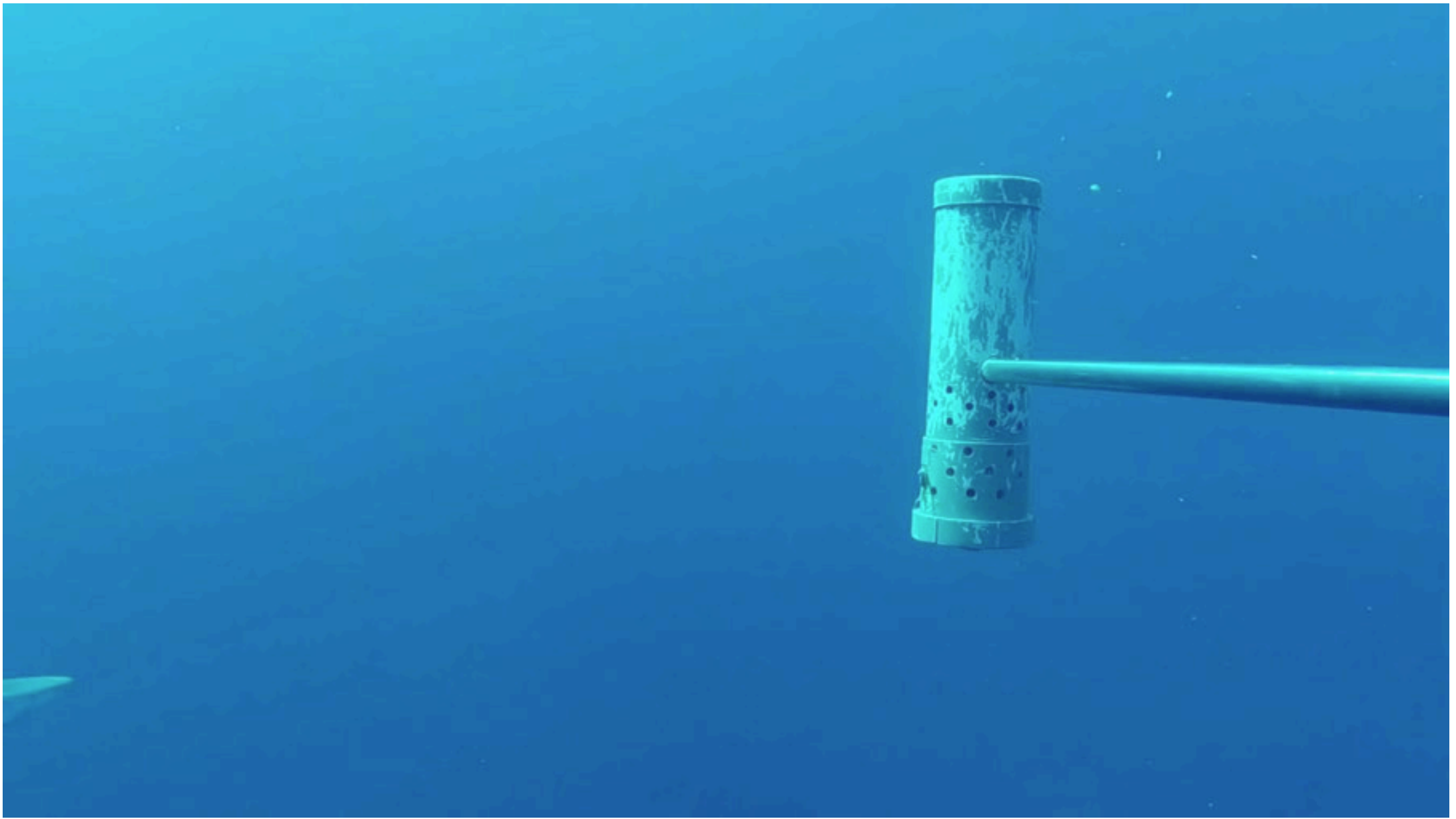
Cabrinha (*Chelidonichthys cuculus*) - 110m



OPEN WATER COMMUNITIES

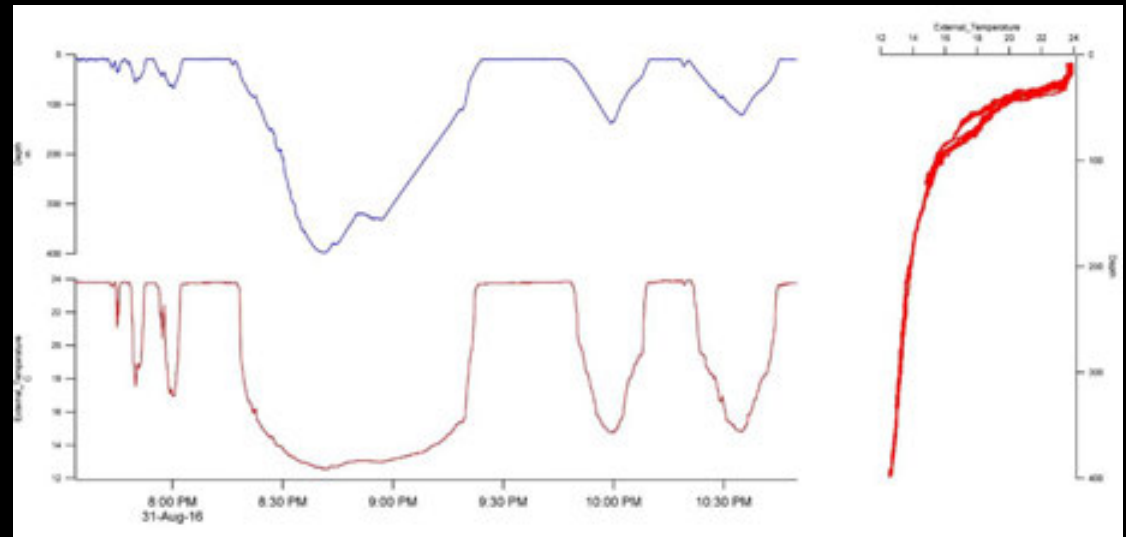
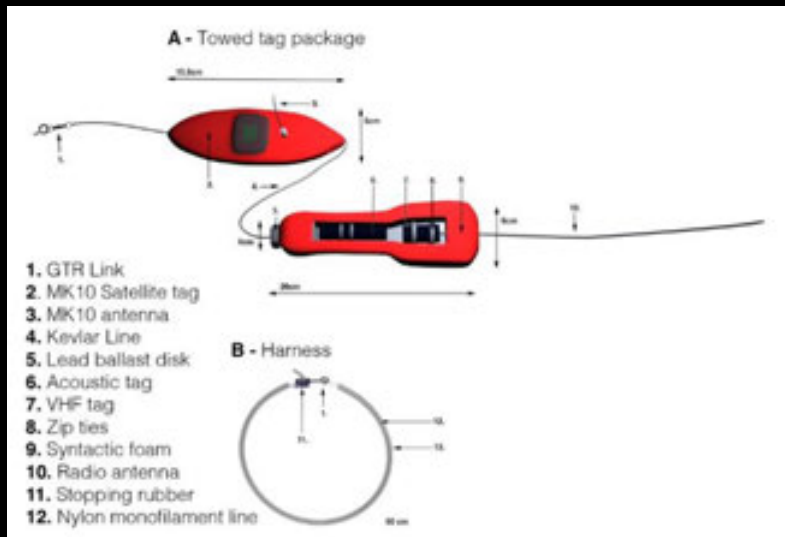
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OPEN WATER DEVIL RAY BEHAVIOUR

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AZORES





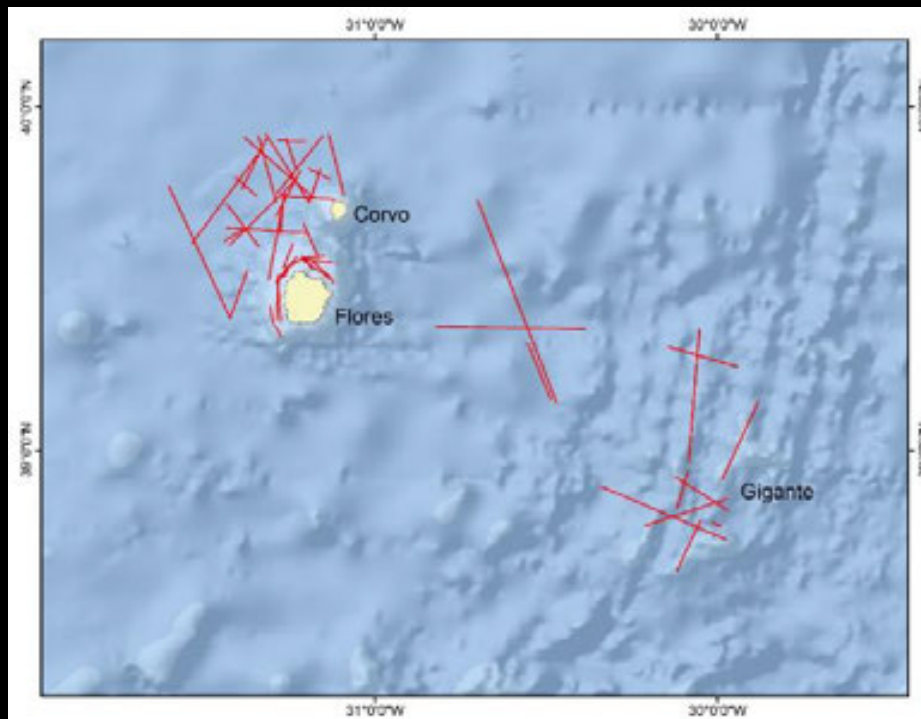
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OPEN WATER

SEABIRDS AND ASSOCIATED MEGAFUNA

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Macaronesian shearwater
Puffinus lherminieri



Monteiro's storm petrel
Hydrobates monteiroi



Cory's shearwater
Calonectris borealis

OPEN WATER

SEABIRDS AND ASSOCIATED MEGAFUNA

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Risso's dolphin
Grampus griseus



Sperm whale
Physeter macrocephalus

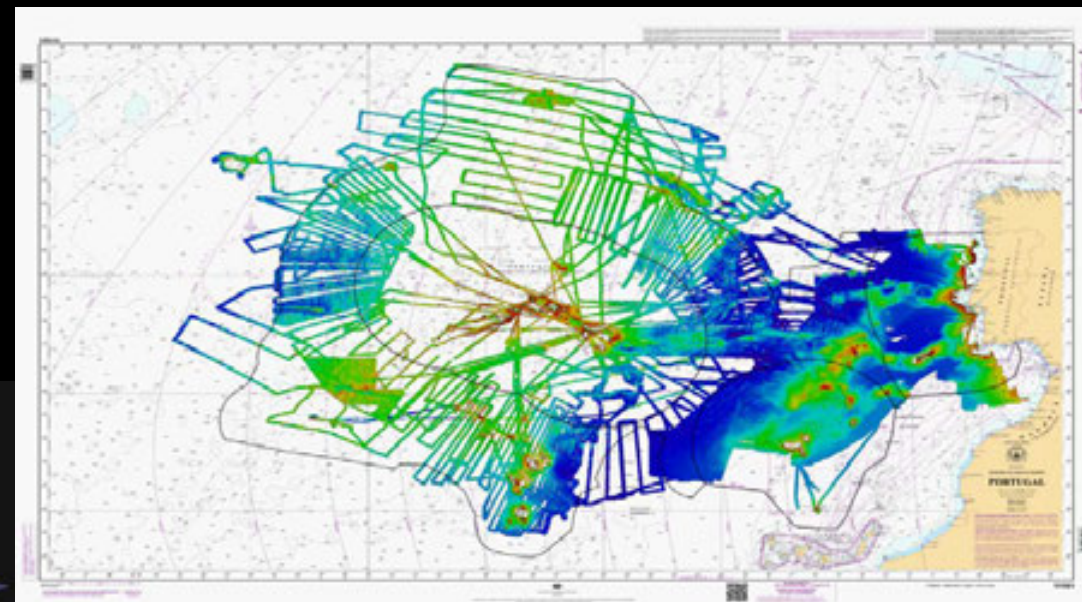
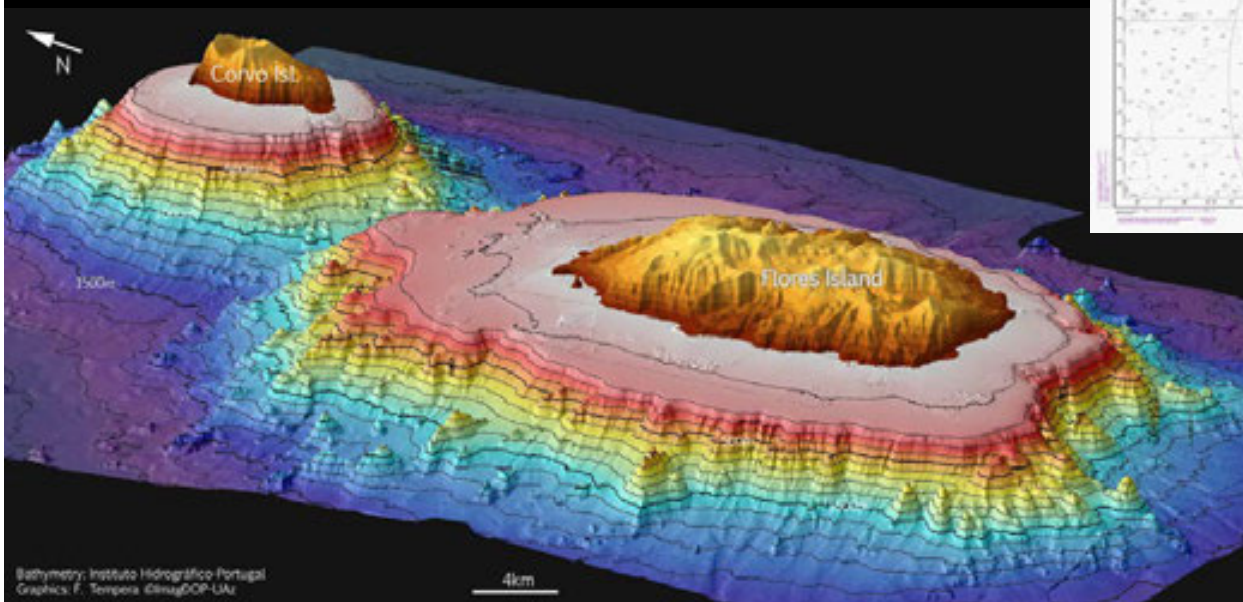




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DEEP SEA SEABED MAPPING

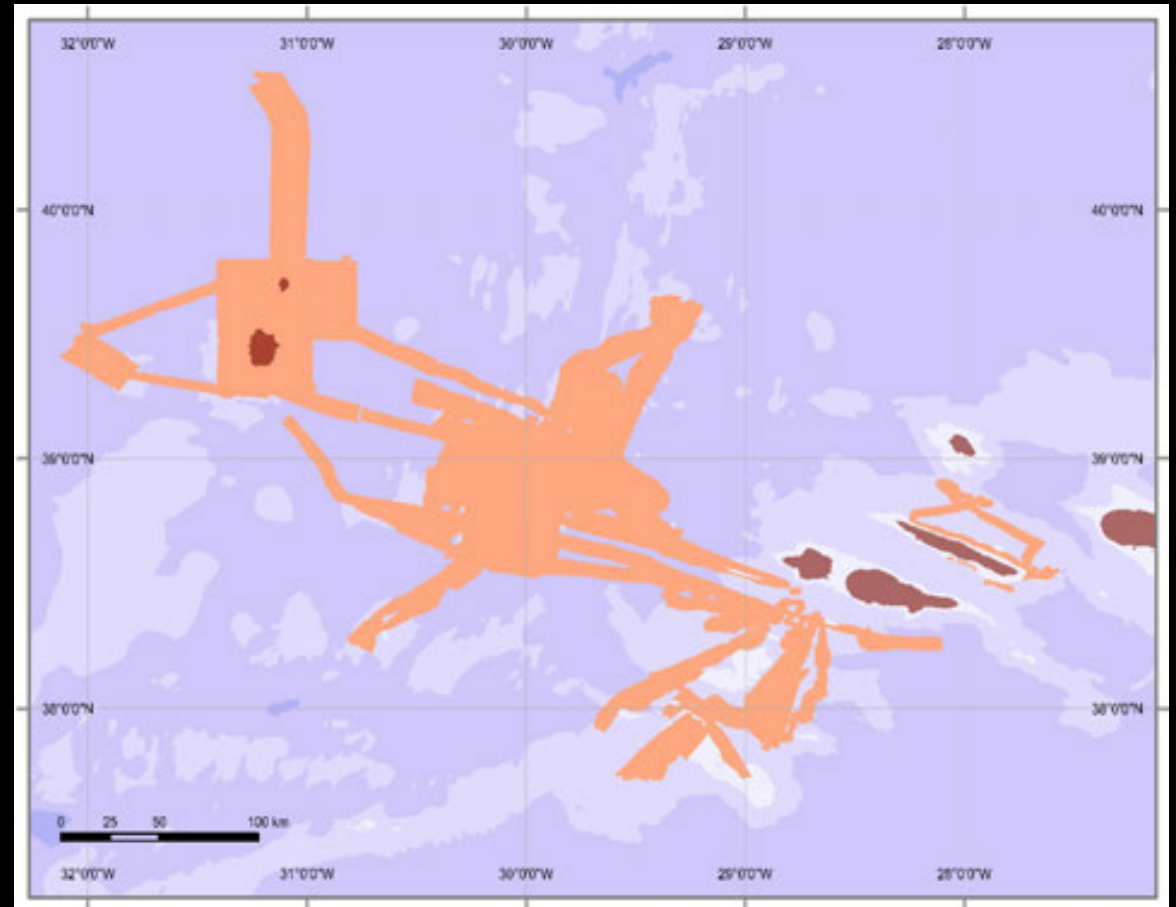
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DEEP SEA SEABED MAPPING

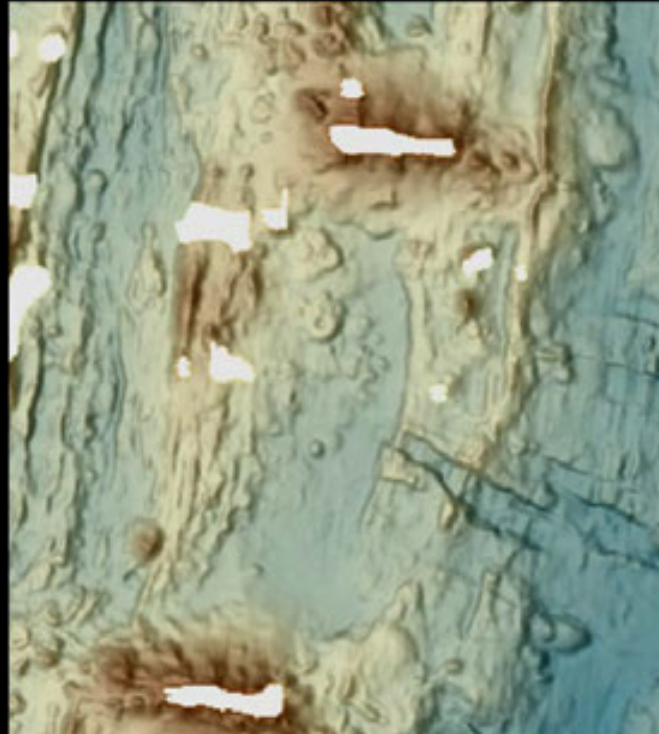
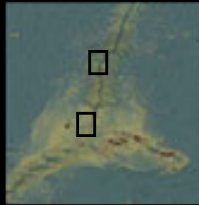
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21.469 km² of
newly mapped sea floor

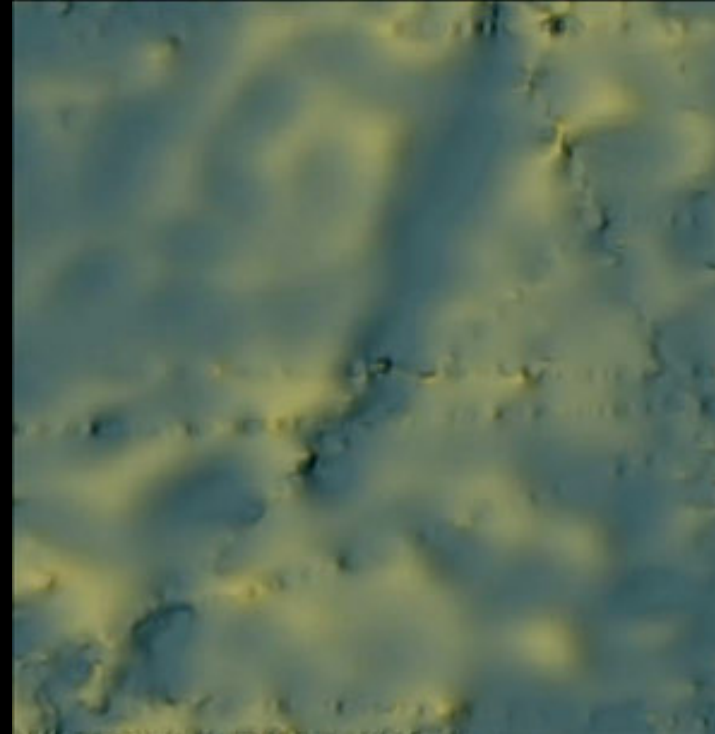


DEEP SEA SEABED MAPPING

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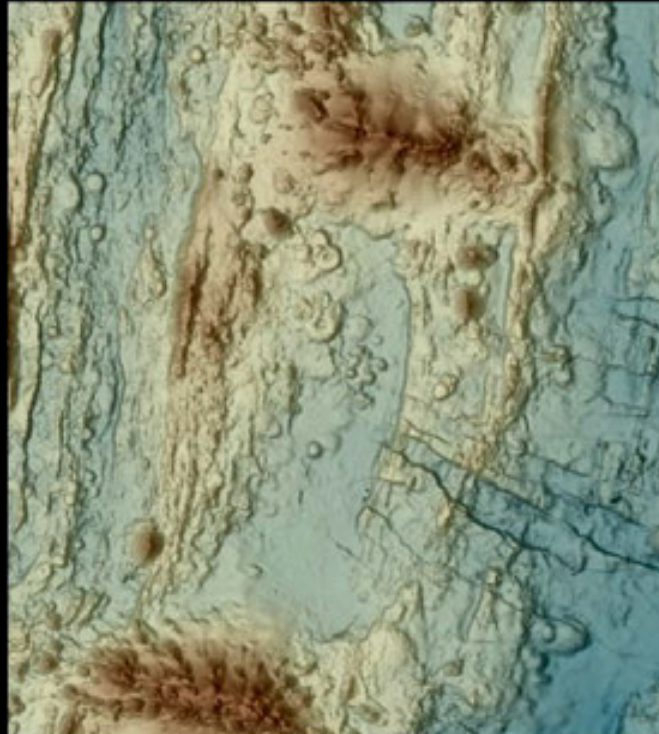
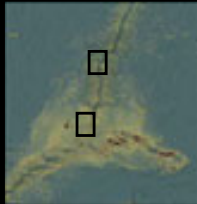
Gigante area



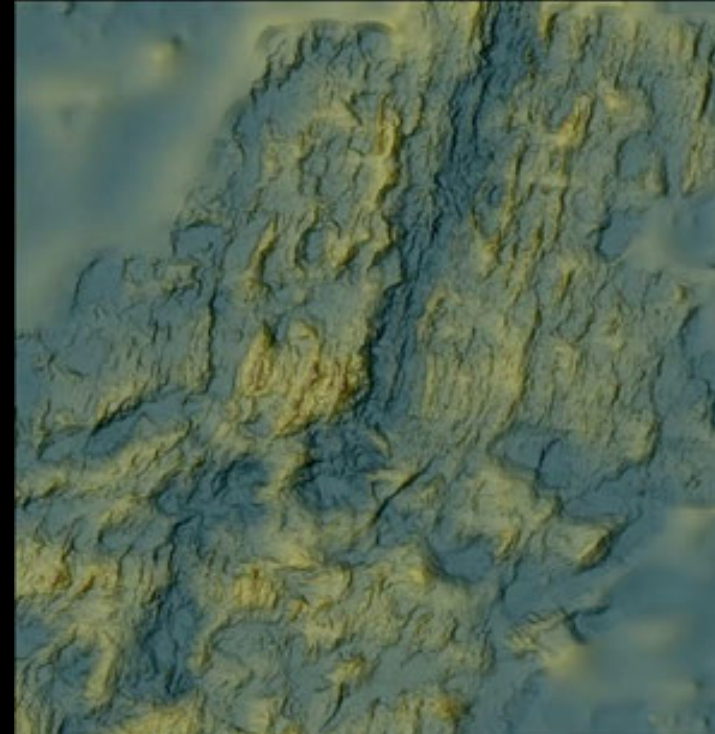
Mid Atlantic Ridge

DEEP SEA SEABED MAPPING

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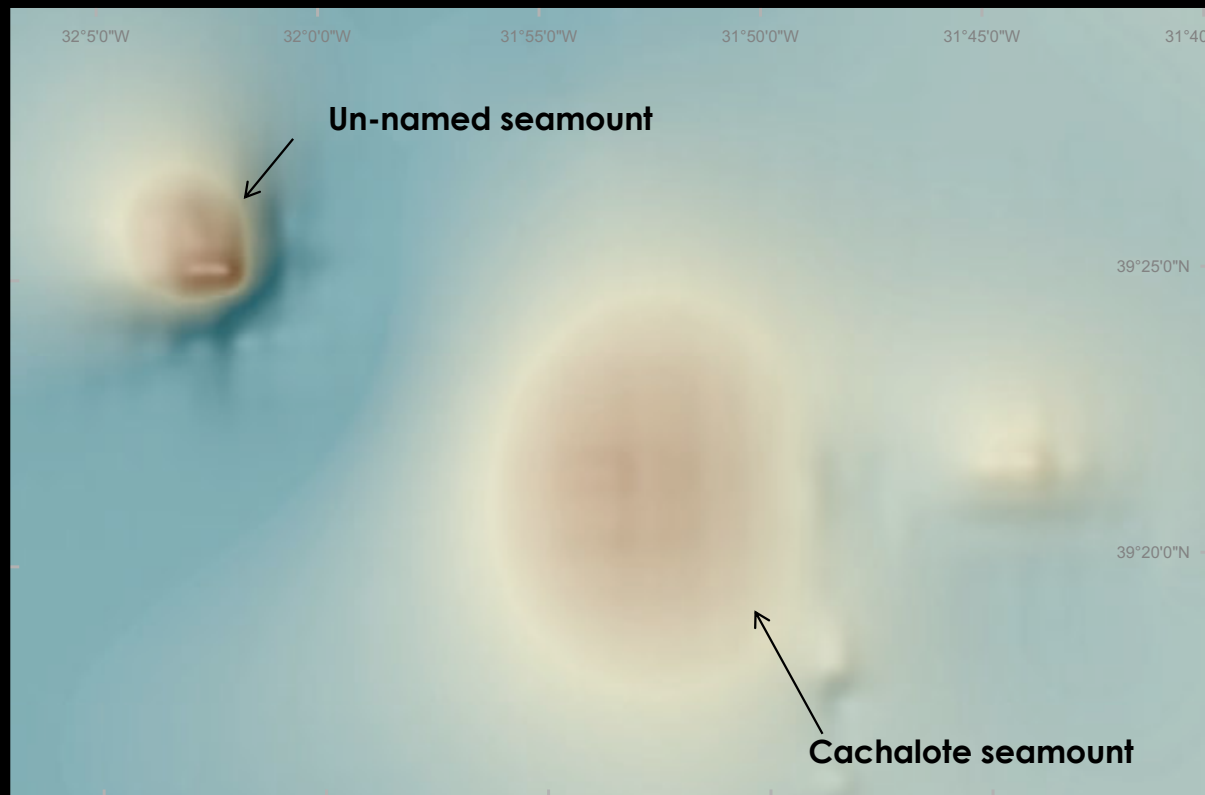
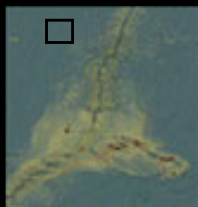
Gigante area



Mid Atlantic Ridge

DEEP SEA SEABED MAPPING

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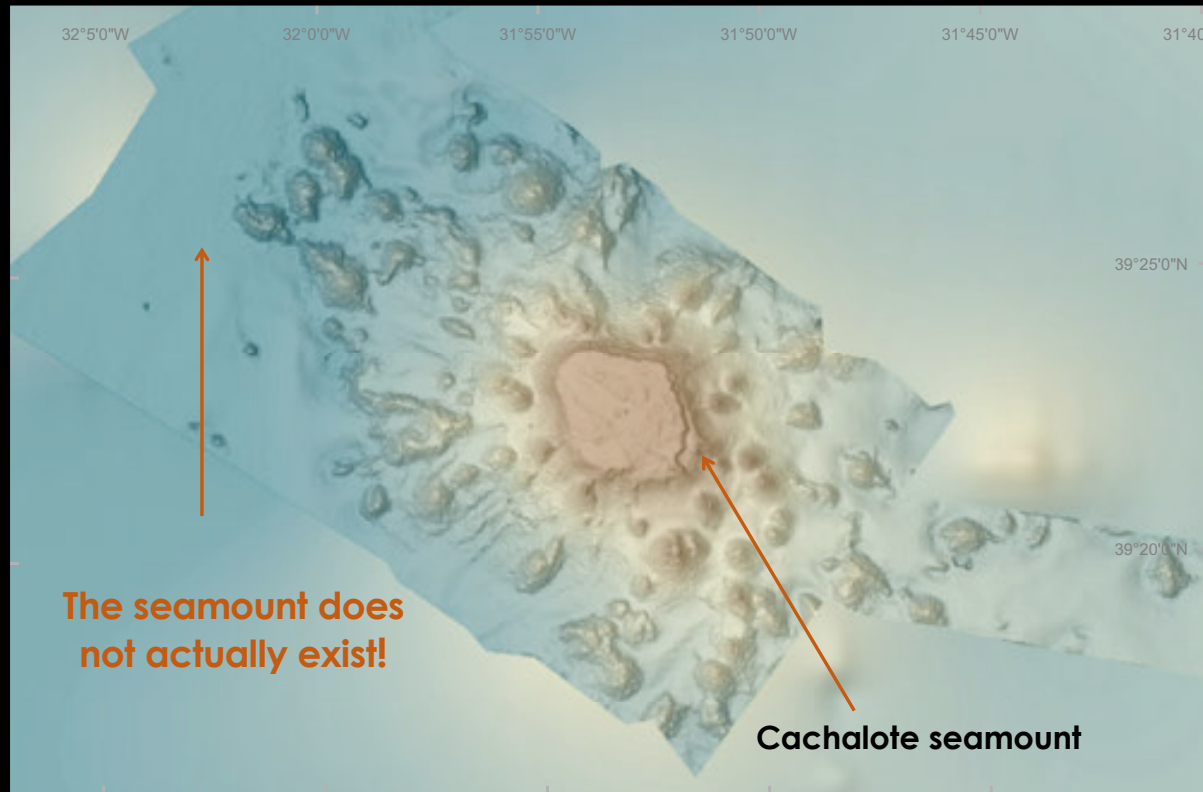


Un-named seamount

Cachalote seamount

DEEP SEA SEABED MAPPING

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The seamount does not actually exist!

Cachalote seamount

DEEP SEA DROPCAMS

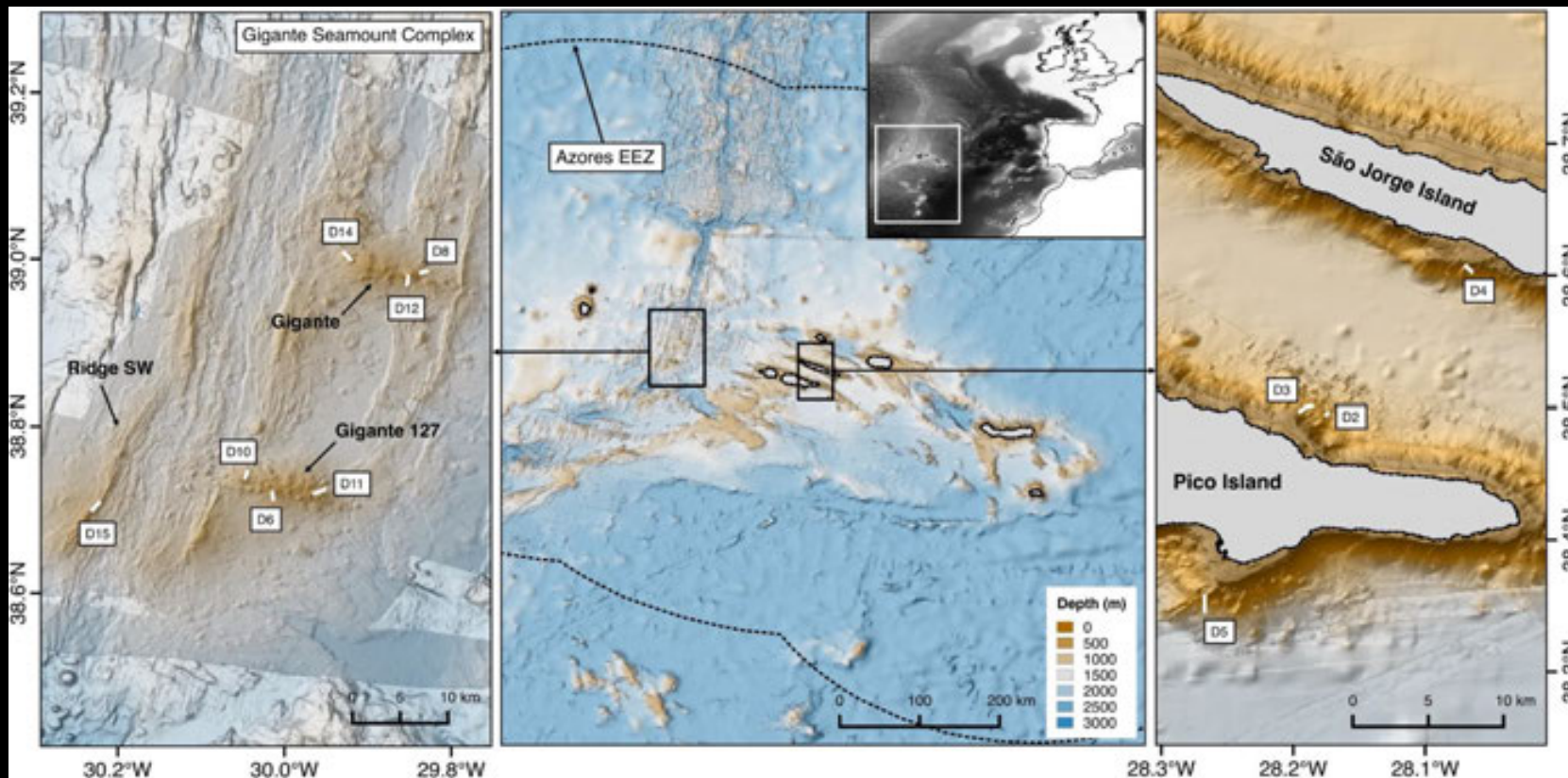
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DEEP SEA ROV

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AZORES



DEEP SEA

ROV – BENTHIC COMMUNITIES

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Viminella & *Acanthogorgia*



Pheronema carpenteri



Neopycnodonte zibrowii
& *Cyathidium foresti*



Paragorgia johnsoni



Narella spp.



Giant sponges



New species



DEEP SEA
ROV

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Paragorgia spp.








RECOMMENDATIONS

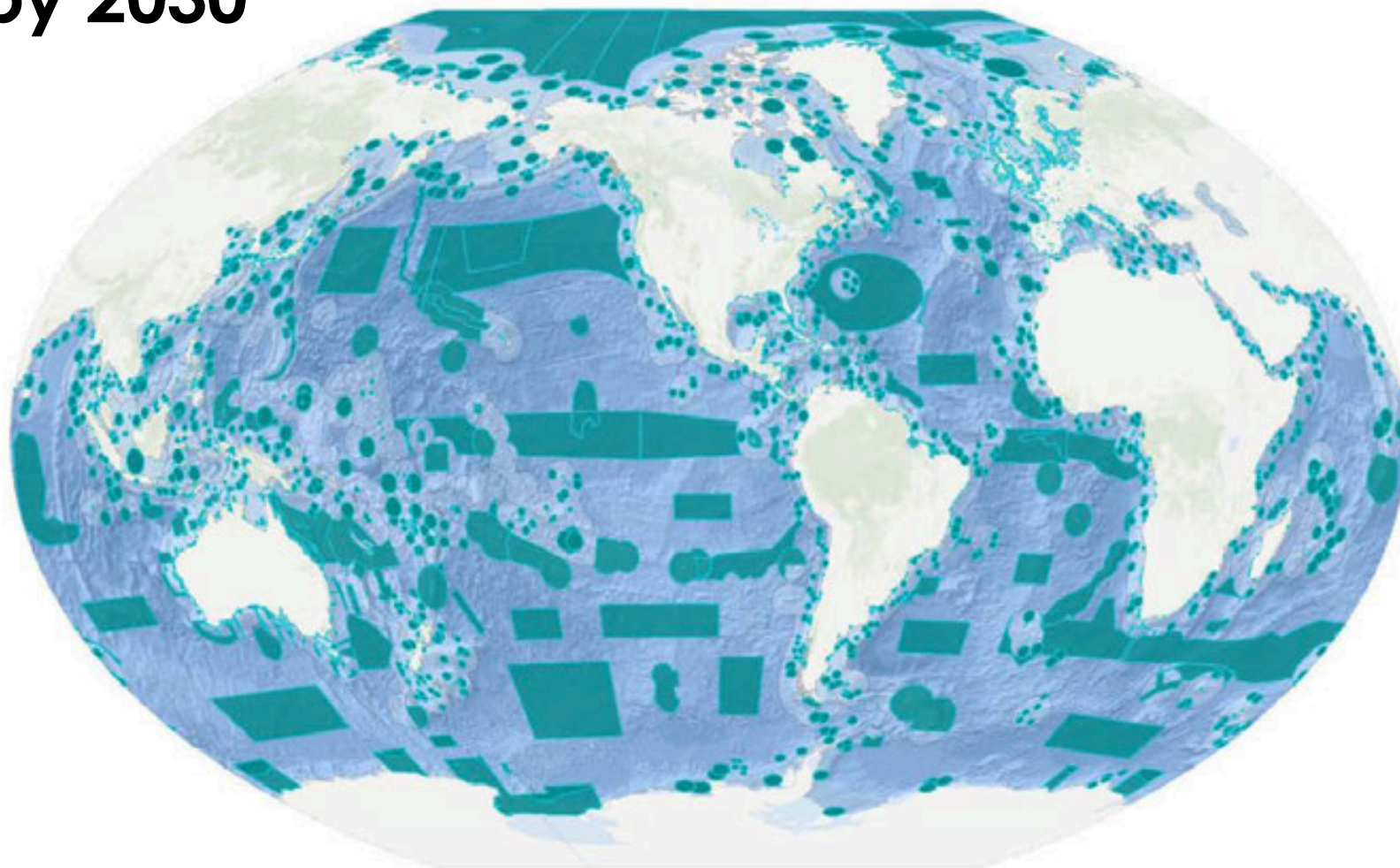
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1. Increase full protection.
 2. Fully implement existing conservation areas.
 3. Promote sustainable fisheries.
 4. Promote education and ocean literacy.
- 

30% by 2030

30% Global Marine Protected Areas Coverage

Ensuring 30% coverage of inshore and offshore all marine ecoregions along all coastlines
EBSAs: converted to marine protected area coverage in high seas areas



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A large jellyfish with a glowing red bell and purple tentacles is shown floating in the ocean. The jellyfish is split horizontally, with its bell above the water surface and its tentacles hanging down into the deep blue water. The background shows a cloudy sky and distant land.

**THE BEST KEPT SECRET
IN THE ATLANTIC**