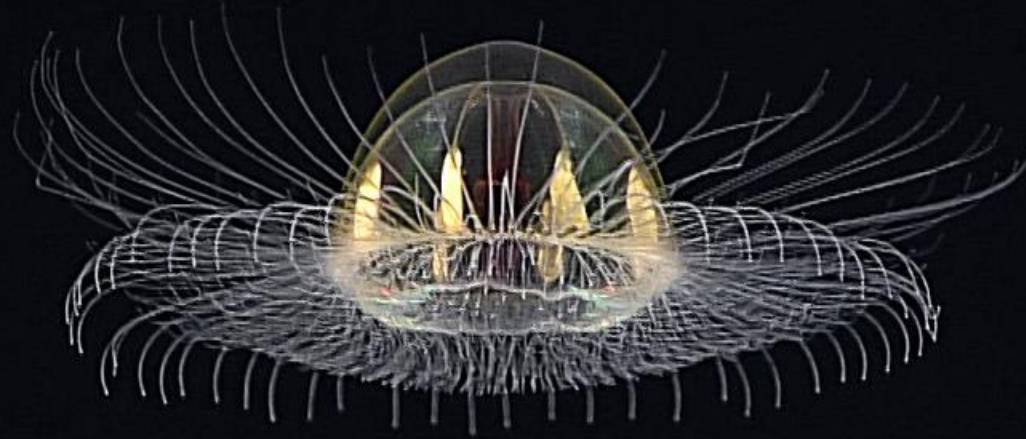


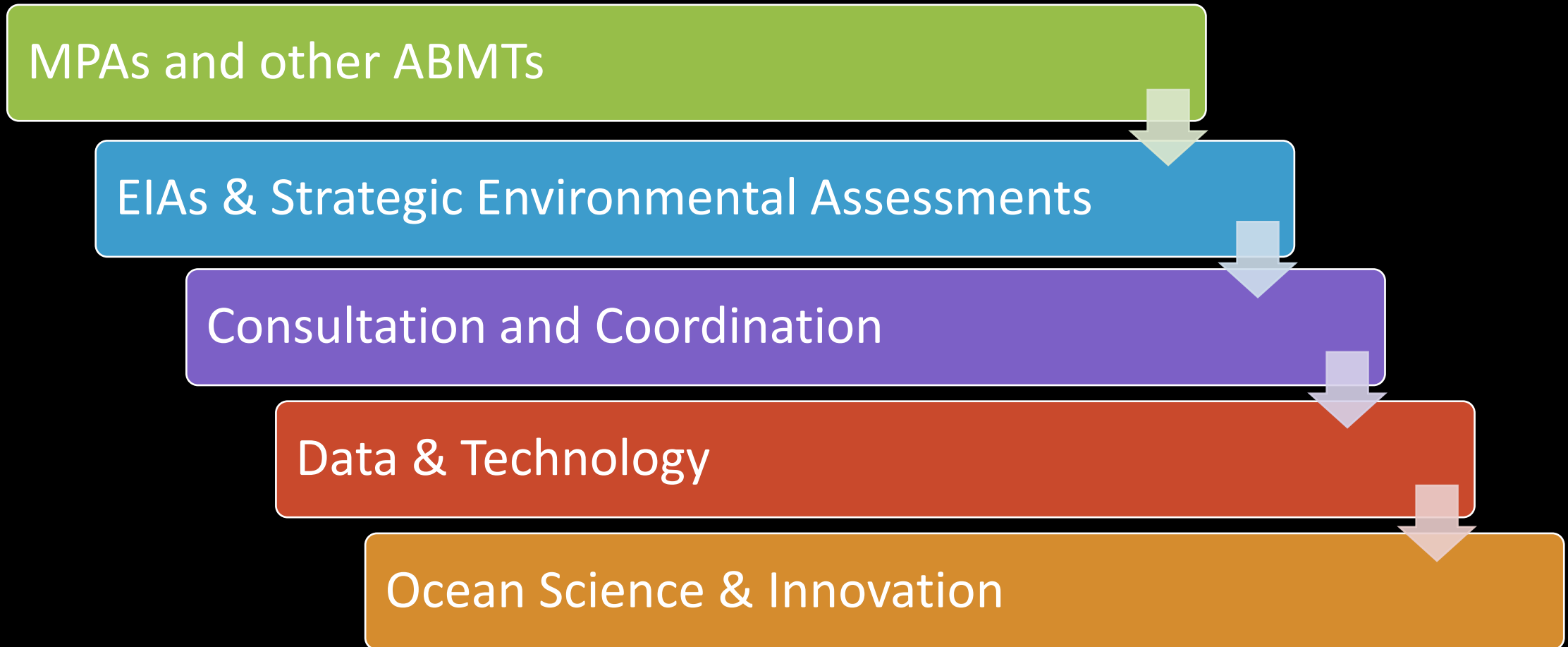
Marine Protected Areas: Roles for the BBNJ Agreement



Fishing on the High Seas and MPAs
WCEL, WCPA and IIJS webinar
13 October 2020

Kristina M. Gjerde
Senior High Seas Advisor, IUCN GMPP
Member WCEL and WCPA

Key message: BBNJ Agreement is vital tool for strengthening ecological and institutional resilience

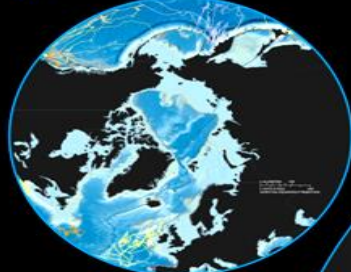


Why? The ocean is connected to us in many ways



Ocean Life

Diversity, Distribution, Abundance



For millennia, the ocean has evaded human imagination with the lure of treasure, mystery, and mystery, all hidden beneath a seemingly endless surface. Centuries of exploration have revealed wonders beneath the waves, but much more remains to be discovered. Facets of oceanography and marine biology remain only partially understood, including questions about the diversity, distribution, and abundance of the life that dwells in the ocean.

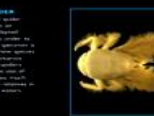
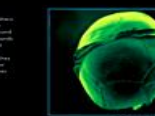
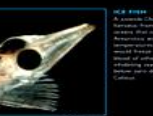
A collaboration of scientists working in an unprecedented scope has provided a push to answer many of these open frontiers. In the year 2000, the first Census of Marine Life began a 10-year effort to reveal the state of life in the ocean. Enlisting some 2,500 researchers from more than 80 countries, it employed divers, nets, and submersible vehicles, genetic identification, sonars, electronics, and acoustic tagging, following species, and examining deep-sea life. The Census spanned all oceanic realms, from coastal waters, to the abyss, from the North Pole across deep-sea to the shores of Antarctica. It systematically compiled information from new discoveries and features, archives, and made it freely accessible. Census explorers found life wherever they looked—a real of species.

The last decade has improved our understanding of the very small, the very large, and very remote creatures that call the ocean home. Marine life continues to bring forth surprises. In the Caribbean, explorers rediscovered a clam that thrived 200–85 million years ago, thought to have been extinct since the early 1800s. In Massachusetts, they found cold-water corals extending over 400 kilometers in waters 500 meters deep—one of the world's longest reefs. Near Chile, they found giant mantled snails covering an area of shallow the size of Greece. Long-term tracking revealed migratory highways. Combining all this information has revealed a deeper understanding of sea, habitat, and ecosystems, and about habitats that have a long history of human contact.

This map highlights discoveries of ocean life—its variety, extent, and habitat. It offers a glimpse into the discoveries of a decade's investigation into life in all ocean realms from microbes to whales.



Discovery and Fascination
 Life reveals new dimensions of complexity and beauty beneath the sea. Our species and those beneath the sea are more alike than we realize. Discoveries of new life is still expanding as hundreds of new species are discovered every year. Explorers are now sampling and photographing organisms in some of the most extreme environments on Earth.



Ocean Habitats
 The ocean can be divided into distinct realms where changes in terrain and environmental parameters create ecological niches for life. Many habitats are interconnected, with life in the ocean floor is mapped in detail and life in the water column mapped in depth of sunlight is barely mapped. The physical boundaries between surface biologically diverse regions forming of essentially different habitats.

NEAR SHORE
 Shallow areas where wind and sea interact and where the most important fisheries exist.

CORAL REEF
 A highly diverse and productive habitat with a complex 3D structure.

CONTINENTAL SHELF
 The shallow part of the ocean floor that extends from the continental margin to the edge of the continental shelf.

CONTINENTAL SLOPE
 The steeply sloping part of the ocean floor that extends from the edge of the continental shelf to the deep-sea floor.

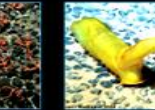
OPEN OCEAN
 The deep-sea floor that extends from the edge of the continental slope to the abyssal plain.

HYDROTHERMAL VENTS
 Deep-sea hydrothermal vents that emit superheated mineral-rich fluids.

SEAMOUNTS
 Isolated underwater mountains that rise from the seafloor.

ABYSSAL PLAINS
 The deepest part of the ocean floor, characterized by flat, featureless terrain.

ICE OCEANS
 Polar regions where sea ice and glaciers interact with the ocean.



Polar Regions
 The Arctic and Antarctic are the most remote and least explored parts of the ocean. They are home to unique and resilient life forms that have adapted to extreme cold and darkness. The Arctic region is particularly rich in biodiversity, with a high density of marine mammals and birds. The Antarctic region is more isolated, with a focus on krill and other small organisms that support a complex food web.

www.cml.org
 The first Census of Marine Life, completed in 2010, brought together 2,500 scientists from 80 countries to study the diversity, distribution, and abundance of life in the global ocean. The second Census of Marine Life, starting in 2015, will focus on the deep-sea and polar regions, which have been largely unexplored.

CENSUS OF MARINE LIFE

The Census of Marine Life is a global effort to discover and document the diversity, distribution, and abundance of life in the ocean. It is the largest and most comprehensive marine biodiversity assessment ever undertaken. The goal is to provide a baseline of knowledge about the state of the world's oceans and to inform conservation efforts.

PACIFIC BLUEFIN TUNA
 One of the world's most valuable fisheries, bluefin tuna is a highly migratory species that spends much of its life in the open ocean. It is a top predator in its ecosystem and a key species for many coastal fisheries.

PACIFIC SEA TURTLES
 One of the world's most endangered species, the Pacific sea turtle is a highly migratory species that spends much of its life in the open ocean. It is a top predator in its ecosystem and a key species for many coastal fisheries.

PACIFIC SHARKS
 One of the world's most diverse groups of animals, Pacific sharks are highly migratory species that spend much of their life in the open ocean. They are top predators in their ecosystems and play a key role in maintaining the balance of marine food webs.

PACIFIC PINNACLES
 One of the world's most remote and least explored parts of the ocean, the Pacific Pinnacles are a highly diverse and productive habitat. They are home to a wide variety of unique and resilient life forms that have adapted to extreme cold and darkness.

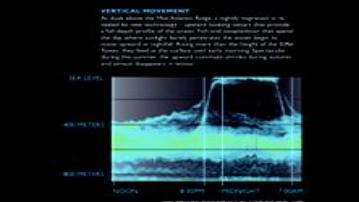
ATLANTIC BLUEFIN TUNA
 One of the world's most valuable fisheries, Atlantic bluefin tuna is a highly migratory species that spends much of its life in the open ocean. It is a top predator in its ecosystem and a key species for many coastal fisheries.

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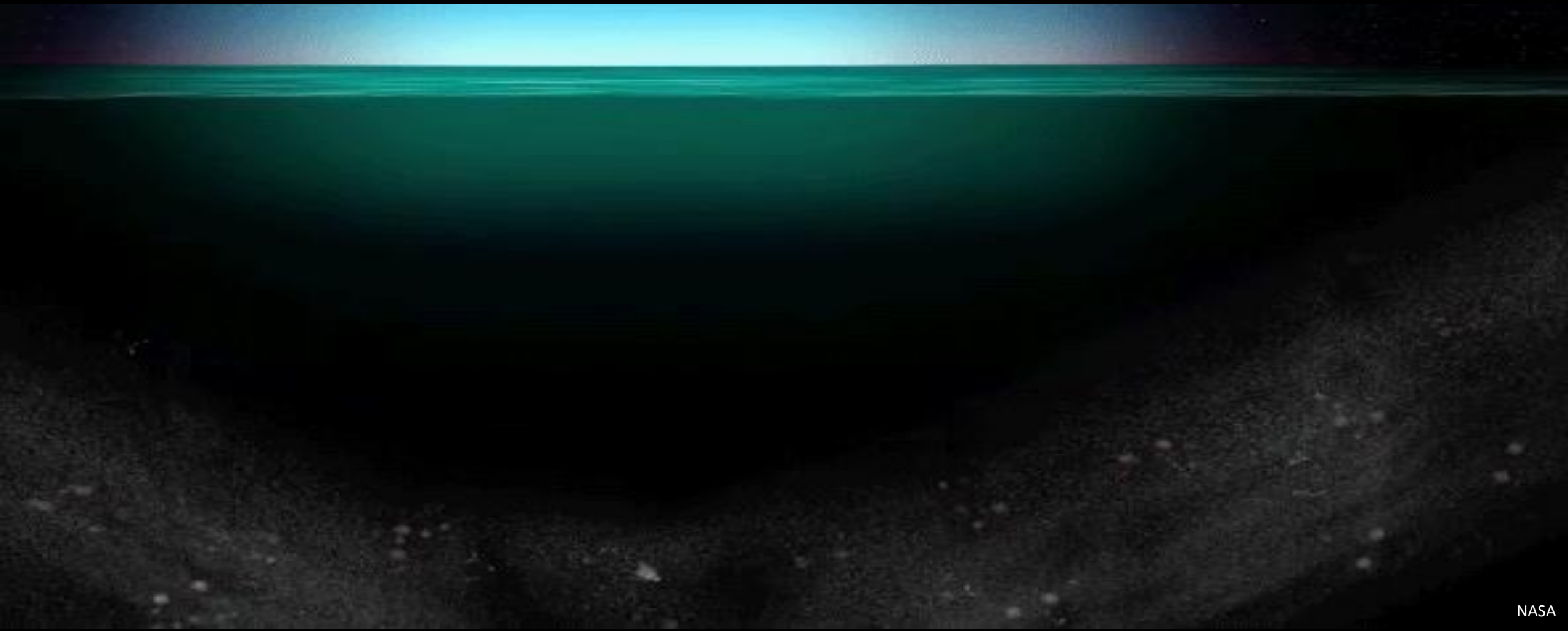
ATLANTIC SHARKS
 One of the world's most diverse groups of animals, Atlantic sharks are highly migratory species that spend much of their life in the open ocean. They are top predators in their ecosystems and play a key role in maintaining the balance of marine food webs.

SOUTHERN OCEAN PINNACLES
 One of the world's most remote and least explored parts of the ocean, the Southern Ocean Pinnacles are a highly diverse and productive habitat. They are home to a wide variety of unique and resilient life forms that have adapted to extreme cold and darkness.

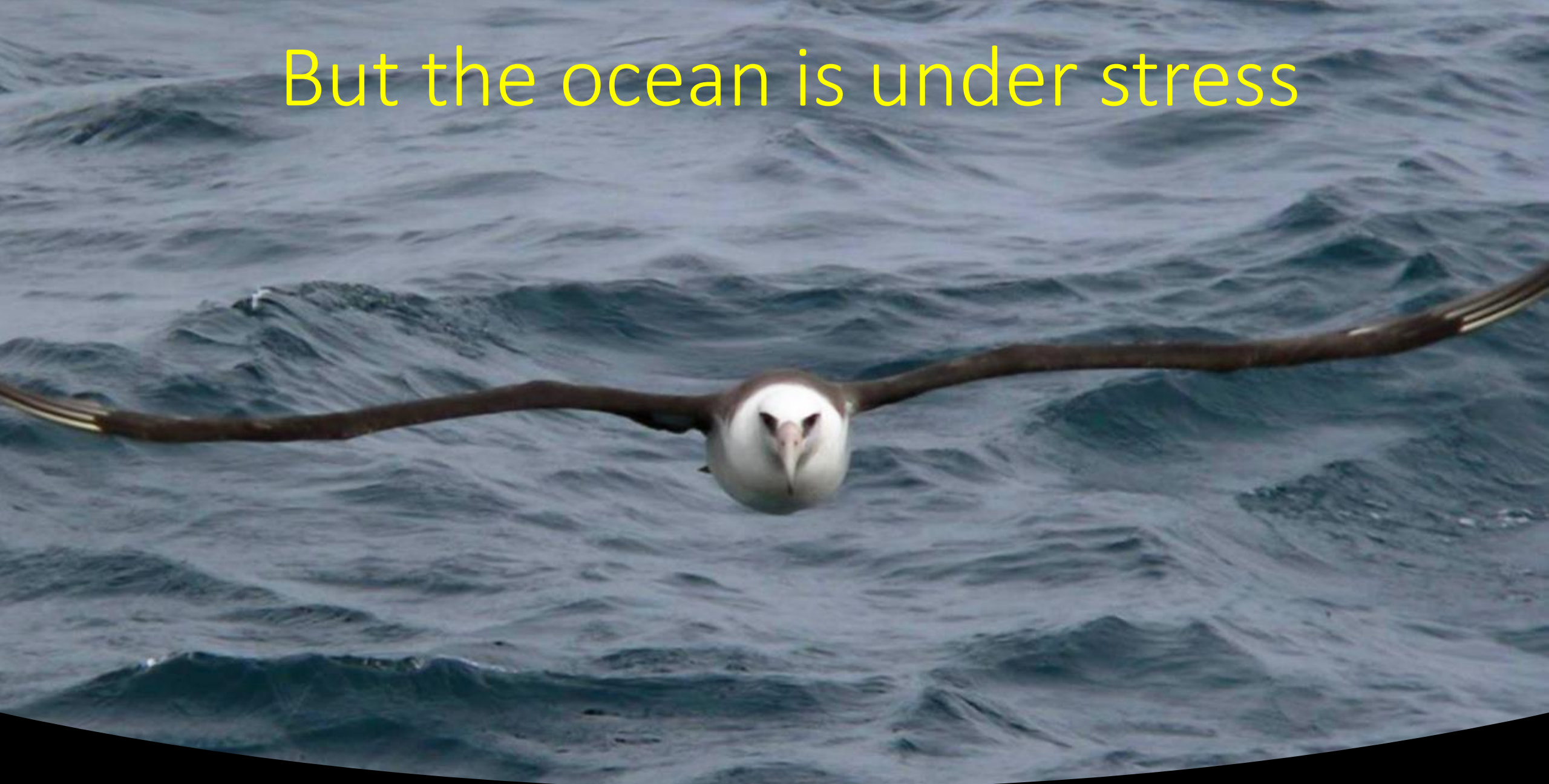
INDIAN OCEAN WHITES
 One of the world's most remote and least explored parts of the ocean, the Indian Ocean Whites are a highly diverse and productive habitat. They are home to a wide variety of unique and resilient life forms that have adapted to extreme cold and darkness.



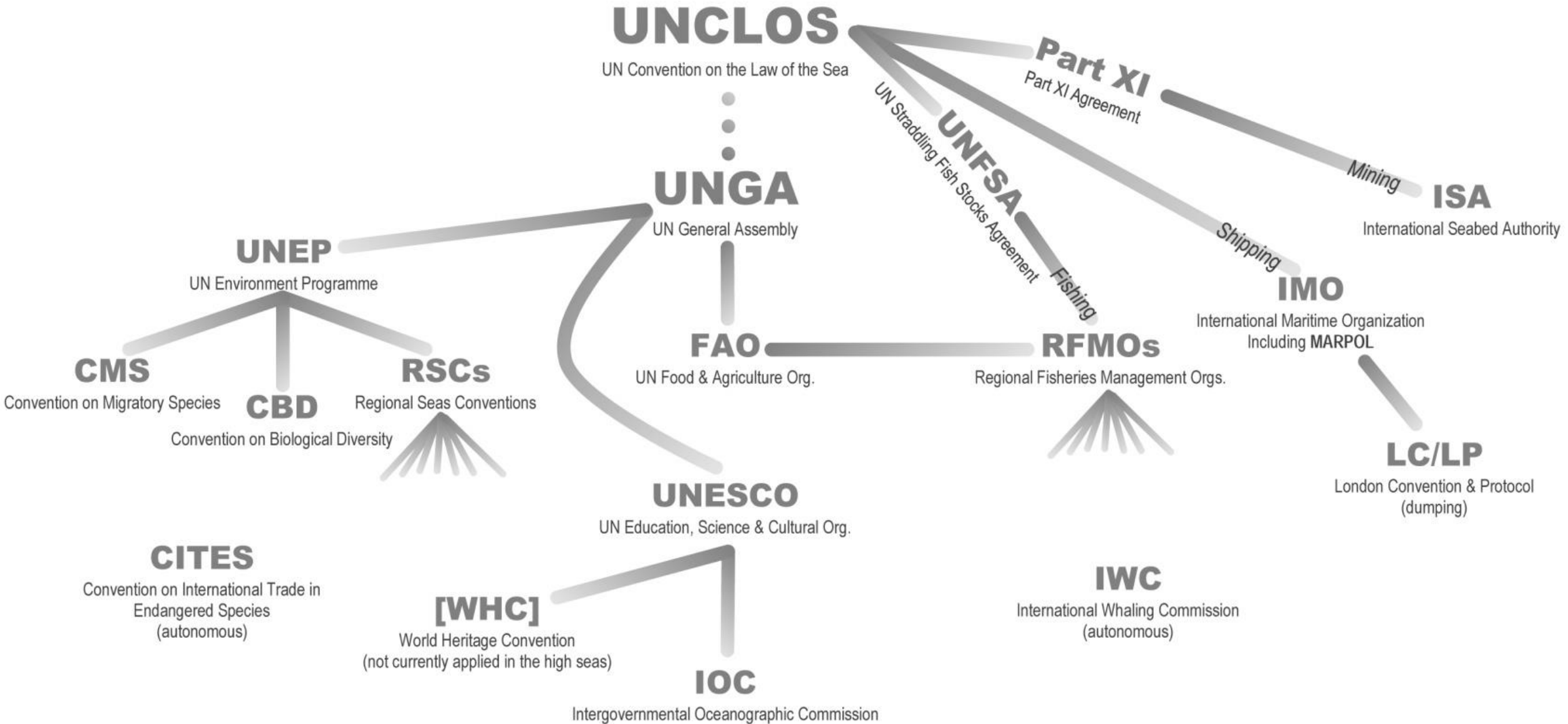
Ocean is vertically connected too!



But the ocean is under stress



Challenge of sharing stewardship in a fractured system



Unregulated, unreported [and unassessed] fishing can weaken ecosystems

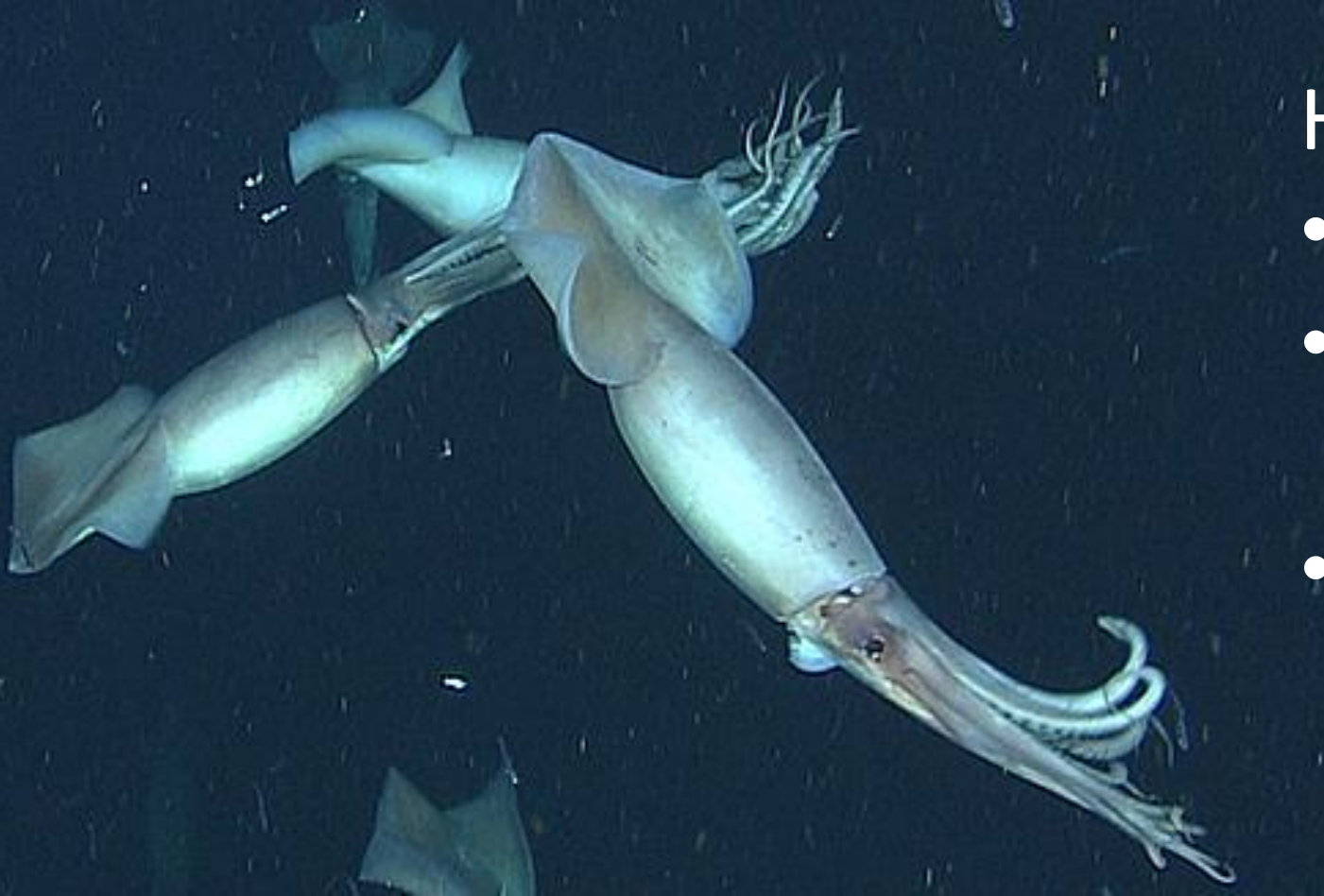


Image: © 2009 MBARI

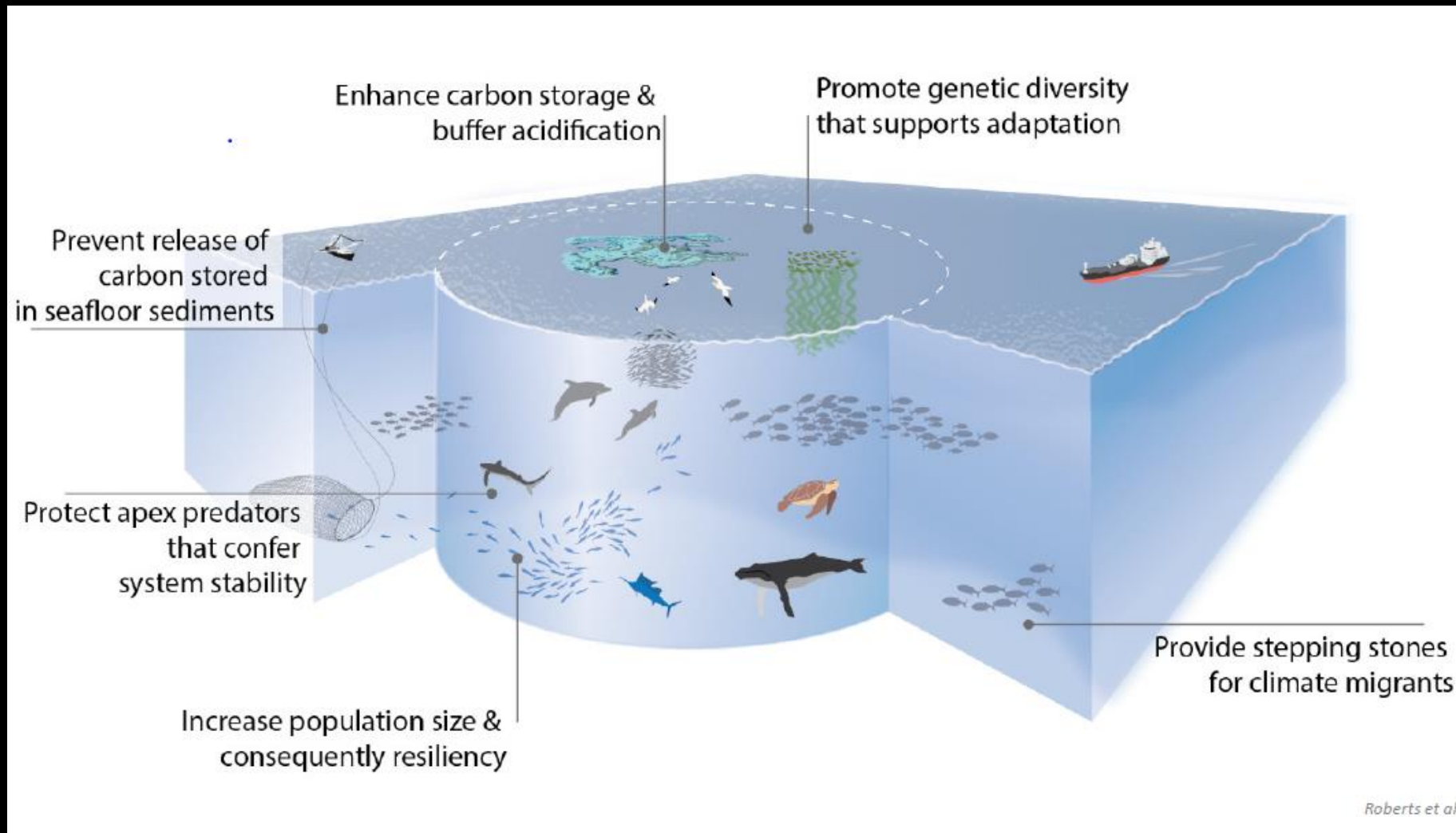
Humboldt squid:

- Fished since 1990s
- Rising concerns about overfishing
- 2021: first requirements for data, VMS and 5% observer coverage (SPRFMO [CMM 18-2020](#))

What role for BBNJ Agreement?



Global mechanism for marine protected areas



Importance of MPAs for climate resilience



Discovery and Fascination
Life reveals new dimensions of complexity and beauty beneath the sea. Oceanography and biology have joined forces to explore the diversity and abundance of life that thrives in the ocean.

A CRAB
A crab was found in a 2,000-meter-deep trench in the Pacific Ocean. It was the first crab ever found in that depth.

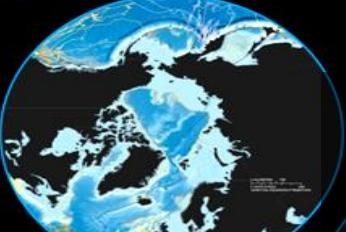
A JELLYFISH
A jellyfish was found in the Indian Ocean. It was the first jellyfish ever found in that region.

A FISH
A fish was found in the Atlantic Ocean. It was the first fish ever found in that area.

A GREEN JELLYFISH
A green jellyfish was found in the Pacific Ocean. It was the first green jellyfish ever found.

A SPIDER
A spider was found in the Indian Ocean. It was the first spider ever found in that area.

A CRAB
A crab was found in the Pacific Ocean. It was the first crab ever found in that area.



For millennia, the ocean has enchanted human imagination with the lure of treasure, mystery, and discovery, all hidden beneath a seemingly endless surface. Centuries of exploration have revealed wonders beneath the waves, but much more remains to be discovered. Facts of oceanography and marine biology remain only partially understood, including questions about the diversity, distribution, and abundance of life that thrives in the ocean.

A collaboration of scientists working with unprecedented scope has provided a push to answer many of these open issues. In the year 2000, the first Census of Marine Life began a 10-year effort to reveal the state of life in the ocean. Involving more than 2,700 researchers from more than 80 countries, it employed divers, nets, and submersible vehicles, genetic identification systems, electronics, and acoustic tagging, bioactive paints, and computers using satellite. The Census spanned all oceans, realms, from coastlines to deep-sea vents, from the North Pole across trip lines to the shores of Antarctica. It systematically compiled information from new discoveries and historic archives and made it freely accessible. Census explorers found life wherever they looked – a rich of species.

The last decade has improved our understanding of the very small, the very large, and very remote creatures that call the ocean home. Marine life continues to bring forth surprises. In the Caribbean, explorers discovered a lion that thrived 200–450 million years ago, thought to have never existed since the early 1800s. In Antarctica, they found cold-water corals extending over 400 kilometers in waters 500 meters deep – one of the world's longest reefs. Near Chile, they found giant microbial mats covering an area of seafloor the size of Greece. Long-term tracking revealed important biological connections. This information has created a deeper understanding of new habitats and ecosystems, and also of habitats that have a long history of human contact.

This map highlights discoveries of ocean life – its variety, extent, and habitat. It offers a glimpse into the discoveries of a decade's investigation into life in all ocean realms from microbes to whales.



... for integrating biodiversity

Ocean Habitats

The ocean can be divided into distinct realms where changes in terrain and environmental patterns create ecological niches for life. The ocean floor is composed of deep and shallow in the water column beyond the reach of sunlight is barely lit. The physical characteristics of the ocean floor and water column are so different that they create distinct habitats.

- CORAL REEF**
- CONTINENTAL MARGIN**
- CONTINENTAL SHELF**
- MID-OCEAN RIDGE**
- VENT**
- REEF**
- SEAFLOOR**

- NEAR SHORE**
- CORAL REEFS**
- CONTINENTAL SHELVES**
- CONTINENTAL MARGINS**
- OPEN OCEAN**
- MID-OCEAN RIDGES**
- VENTS AND SEEPS**
- SEAFLOORS**
- HYDRAULIC PLAINS**
- ICE OCEANS**



has revealed the ocean's daily rhythm and the largest seasonal migration yet observed. The overall goal is to determine the diversity, distribution, and abundance of life in the world's oceans.

PACIFIC BLUEFIN TUNA

PACIFIC HERRING

PACIFIC SEA TURTLES

PACIFIC SEABIRDS

PACIFIC SHARKS

PACIFIC PINNACLES

PACIFIC BLUEFIN TUNA

ATLANTIC SEA TURTLES

ATLANTIC SEABIRDS

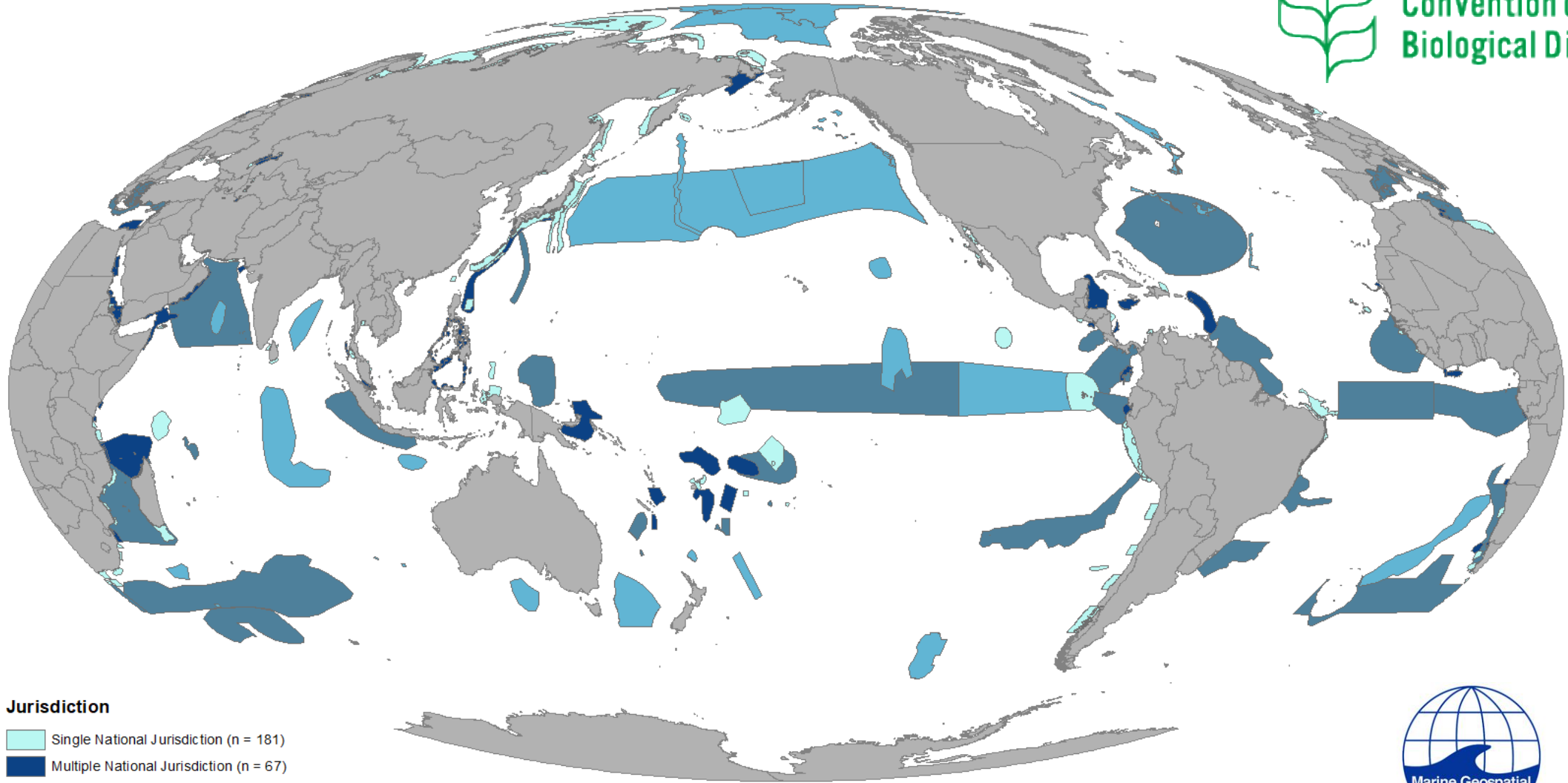
SOUTHERN OCEAN PINNACLES

INDIAN OCEAN WHITES

Polar Regions
Near their geographic poles, the Arctic and Antarctic oceans are surrounded by continents and are the coldest and most remote of the world's oceans. The polar regions both face unique environmental challenges. The Arctic is the only ocean region where waters of all the great oceans meet. The Arctic sea ice is a unique and vital part of the Arctic ecosystem. The presence of Arctic summer sea ice is essential to the survival of many of the organisms that live in the region.

www.coml.org
The first Census of Marine Life, completed in 2010, brought together 2,700 scientists from over 80 countries to explore the diversity, distribution, and abundance of life in the global ocean regions which Nature chose for the investigation.

...and for coordinating across boundaries



Duke University

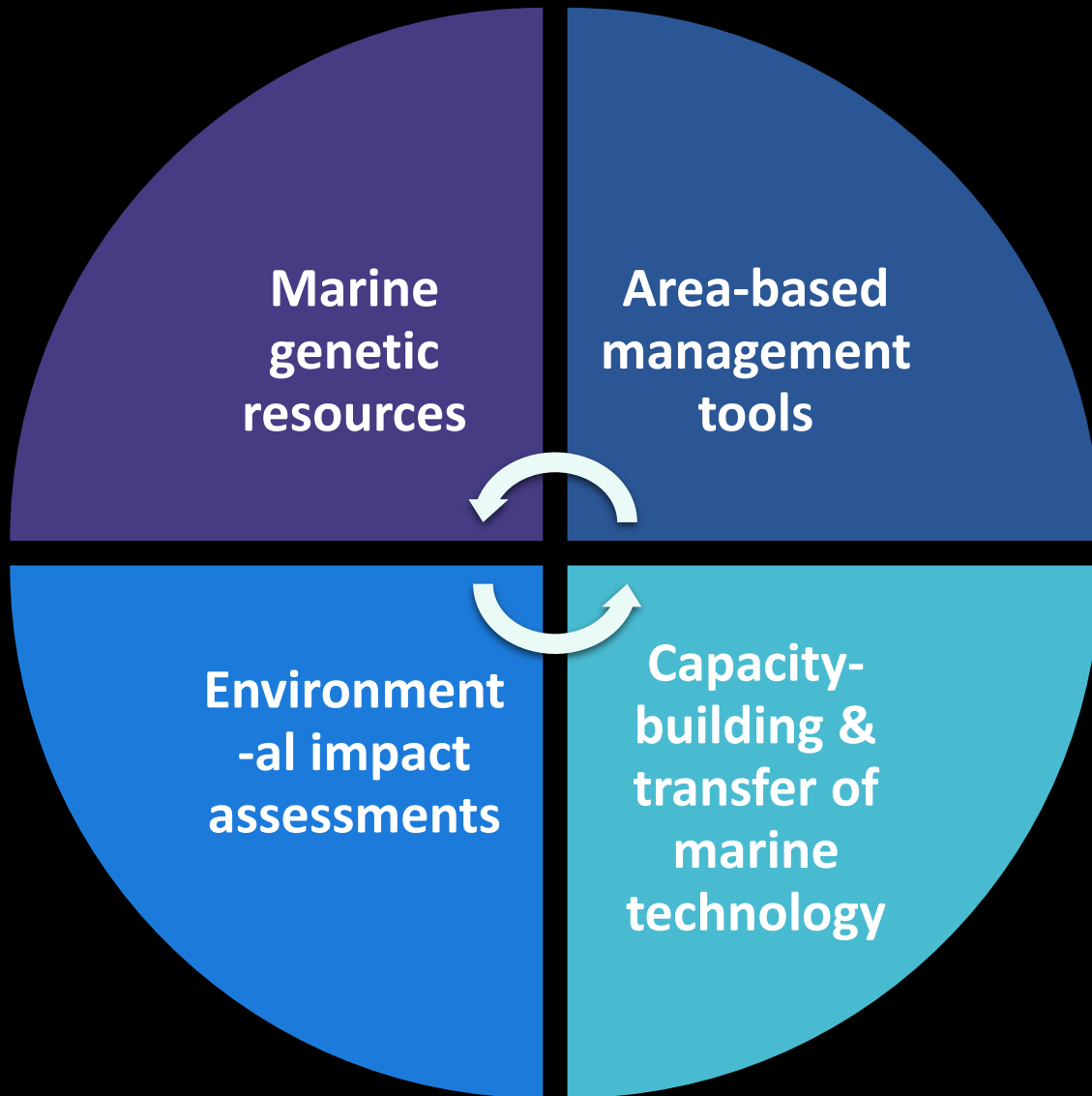
Marine Geospatial Ecology Lab, Duke University (2018)

Jurisdiction

- Single National Jurisdiction (n = 181)
- Multiple National Jurisdiction (n = 67)
- National and Area Beyond National Jurisdictions (n = 38)
- Area Beyond National Jurisdiction (n = 33)

Current distribution of Ecologically or Biologically Significant Areas

Where are we now with BBNJ Agreement?

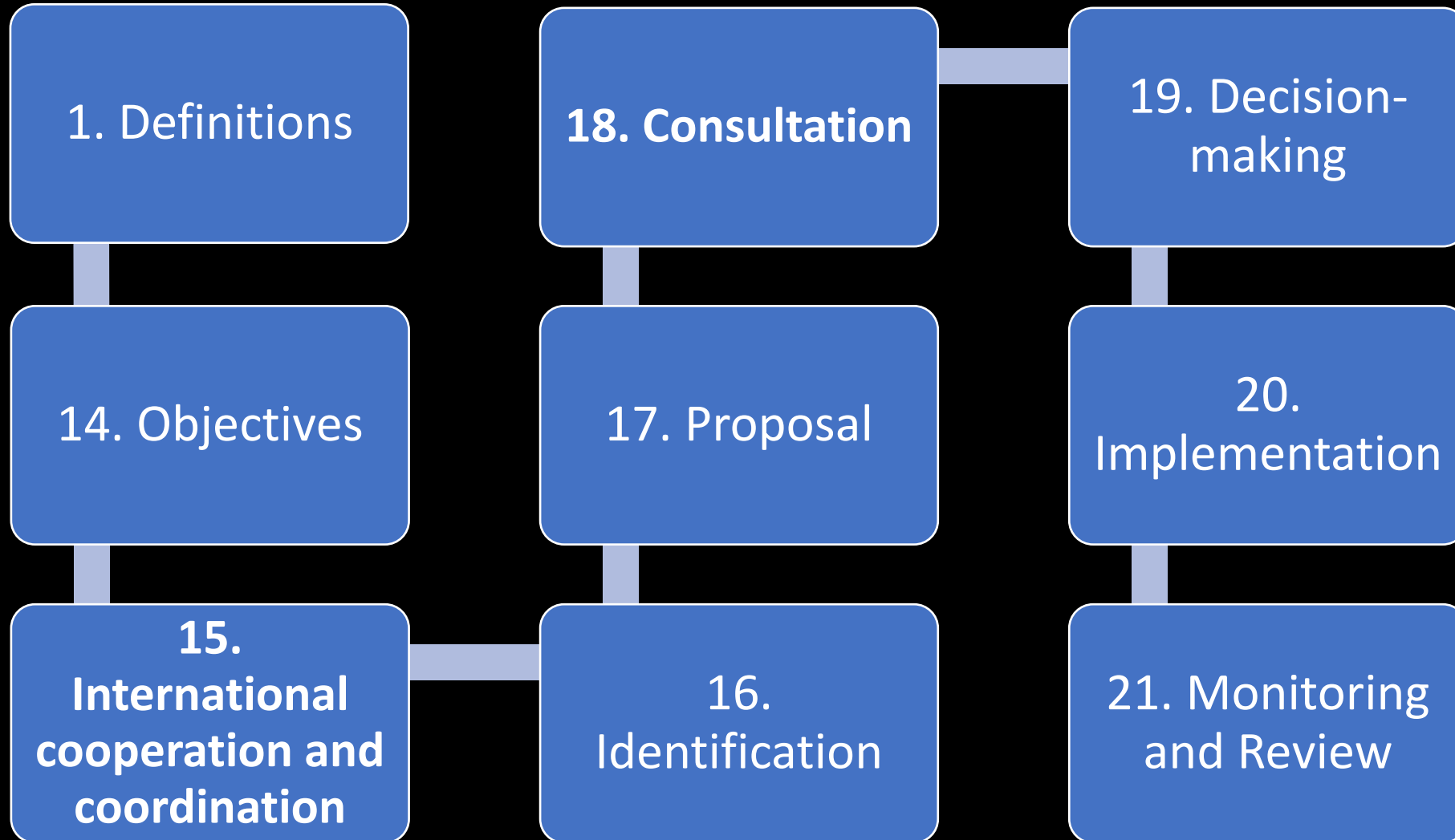


UNGA Resolution A/72/249, 2017

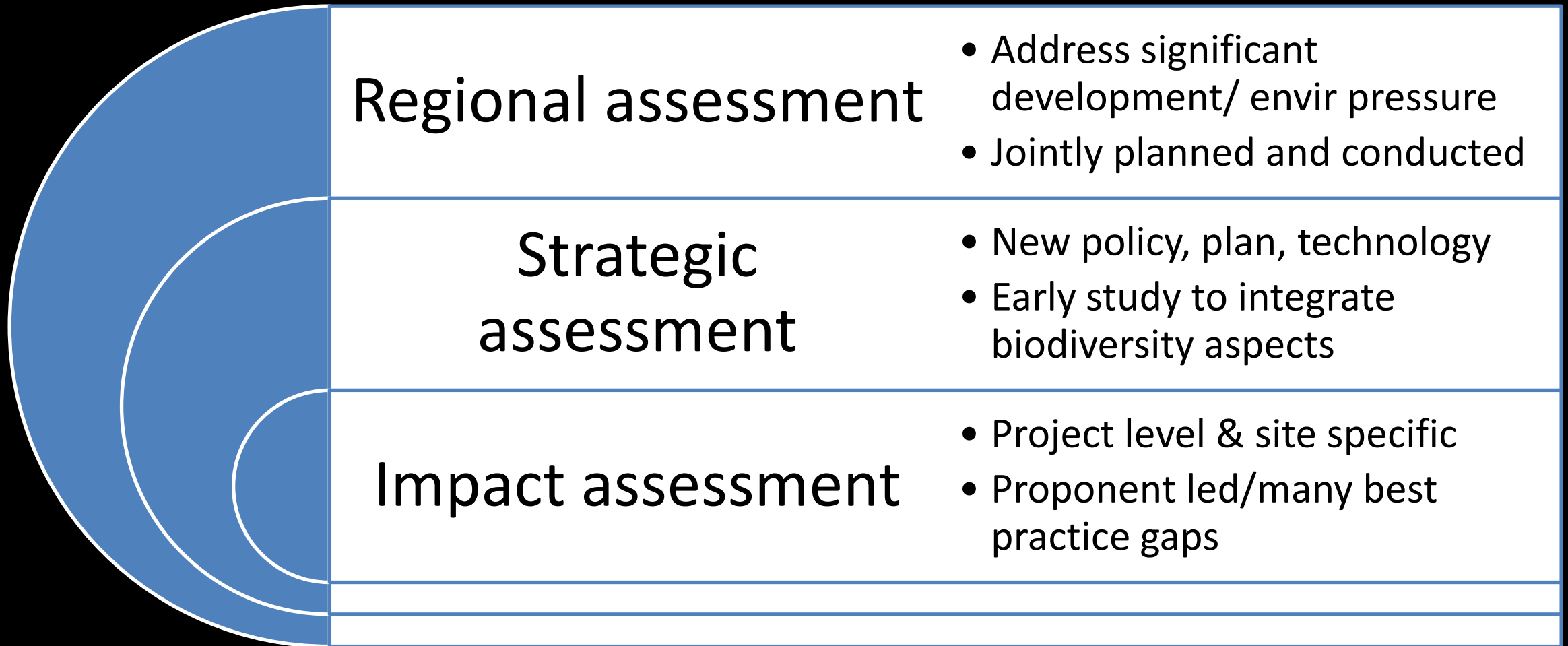
- Package deal
- Not undermine
- Wide participation

- Four meetings over two years
- 4th meeting postponed due to Covid-19

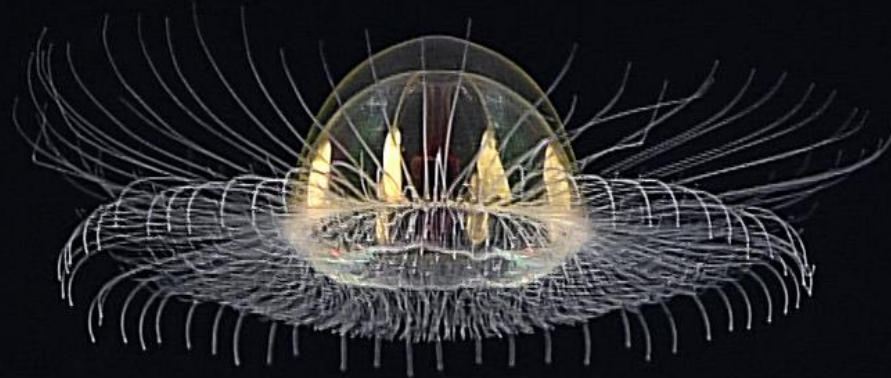
Part III. Area-based Management Tools including Marine Protected Areas (MPAs)



Multiple roles of environmental assessments



What roles for data and technology, science and innovation?

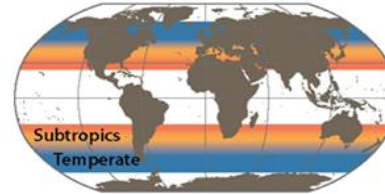


Preparing for future oceans

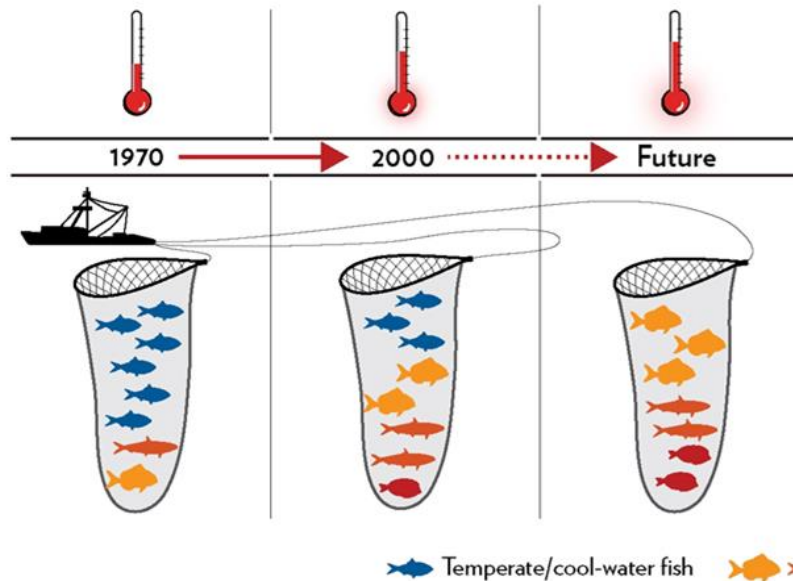
Warming Oceans Are Reshaping Fisheries

Marine species are gradually moving away from the equator into cooler waters, and, as a result, species from warmer waters are replacing those traditionally caught in many fisheries worldwide. Scientific studies show that this change is related to increasing ocean temperatures.

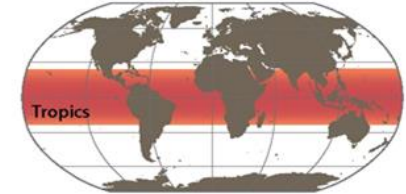
Subtropic and temperate ocean



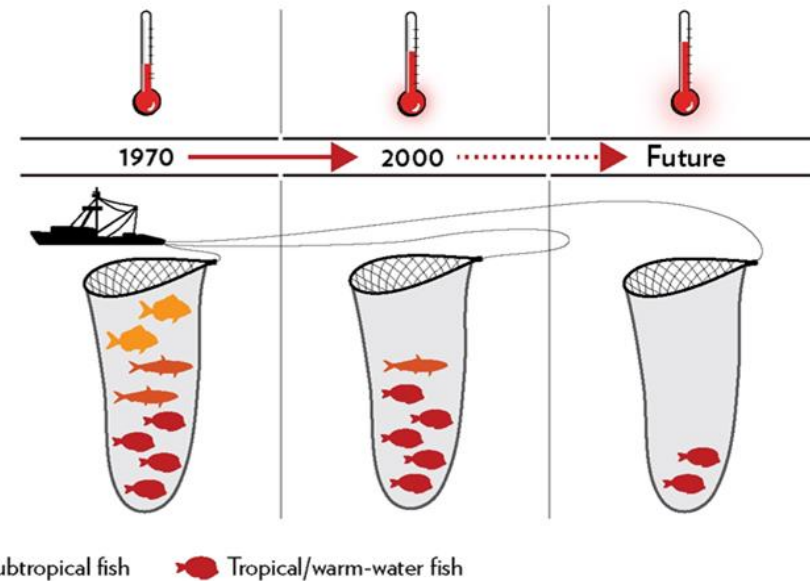
From 1970 to 2006, as open temperatures were rising, catch composition in the subtropic and temperate areas slowly changed to include more warm-water species and fewer cool-water species.



Tropics



In the tropics, the catch composition changed from 1970 to 1980 and then stabilized, likely because there are no species with high enough temperature preferences to replace those that declined.

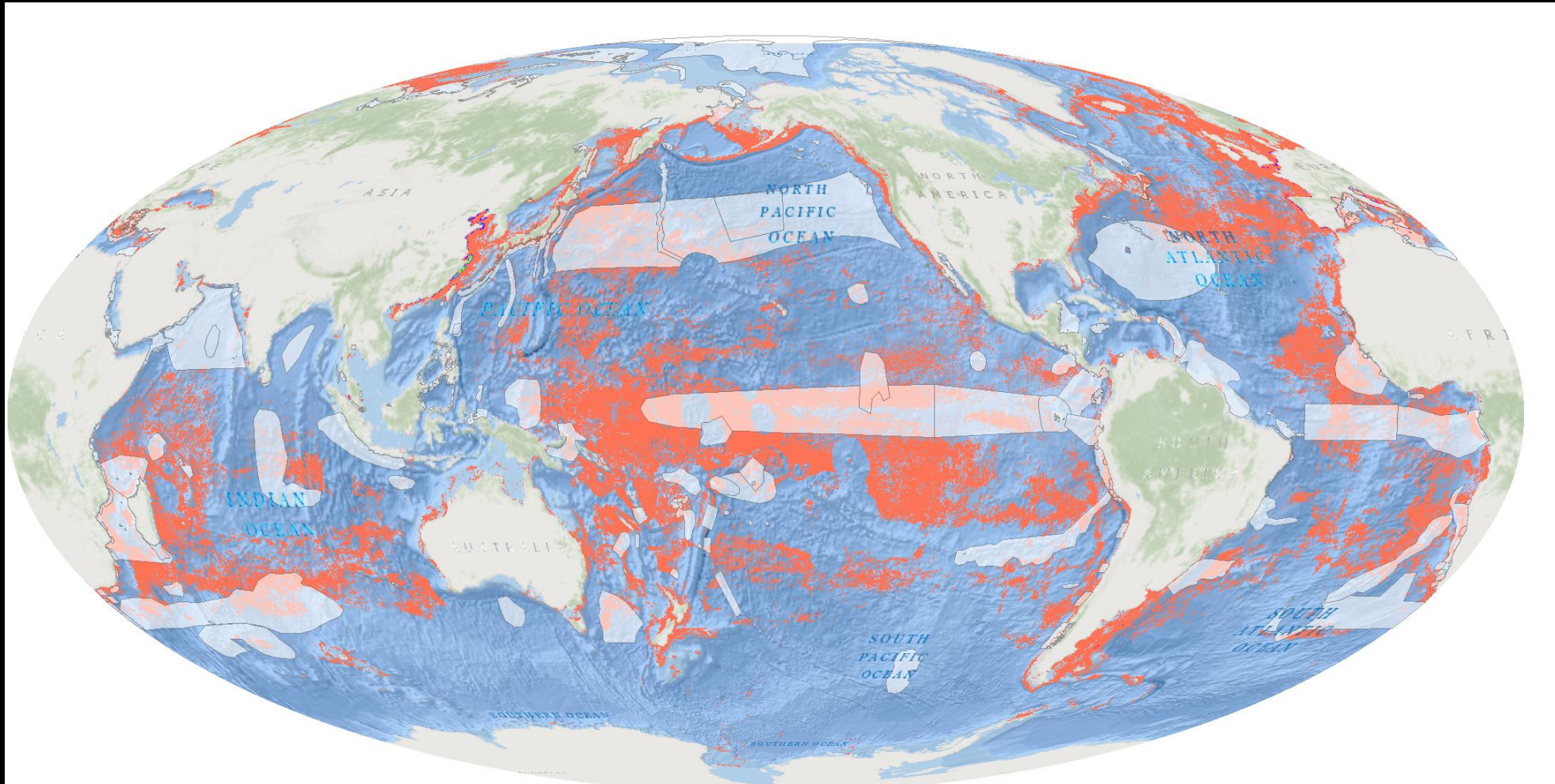


These shifts could have negative effects including loss of traditional fisheries, decreases in profits and jobs, conflicts over new fisheries that emerge because of distribution shifts, food security concerns, and a large decrease in catch in the tropics.

This graphic presents concepts from: Cheung, W.W.L., R. Watson and D. Pauly. 2013. Signature of ocean warming in global fisheries catch. *Nature*. DOI:10.1038/nature12156. The thermometers are representative of trends in ocean temperature over time and the fish are representative of trends in catch composition over time. They do not represent specific values. Please consult the results section of Cheung et al. (2013) for exact data points. Graphic by The Pew Charitable Trusts' ocean science division, www.pewenvironment.org/research-programs

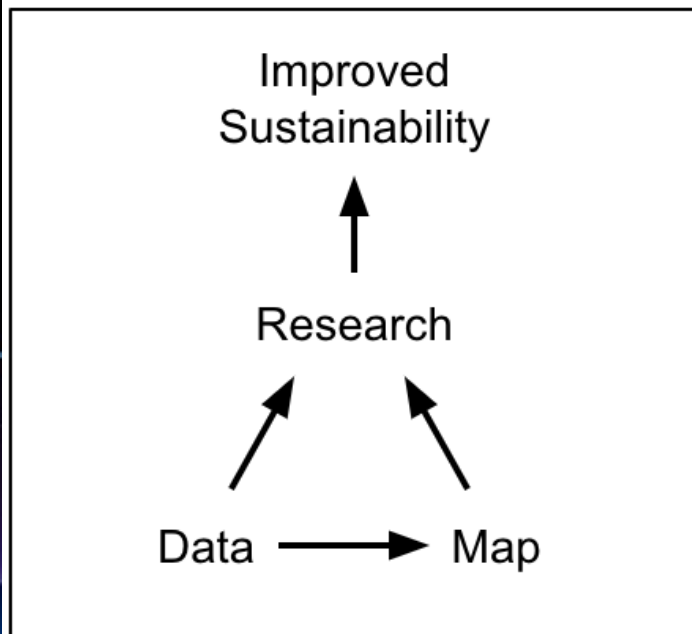
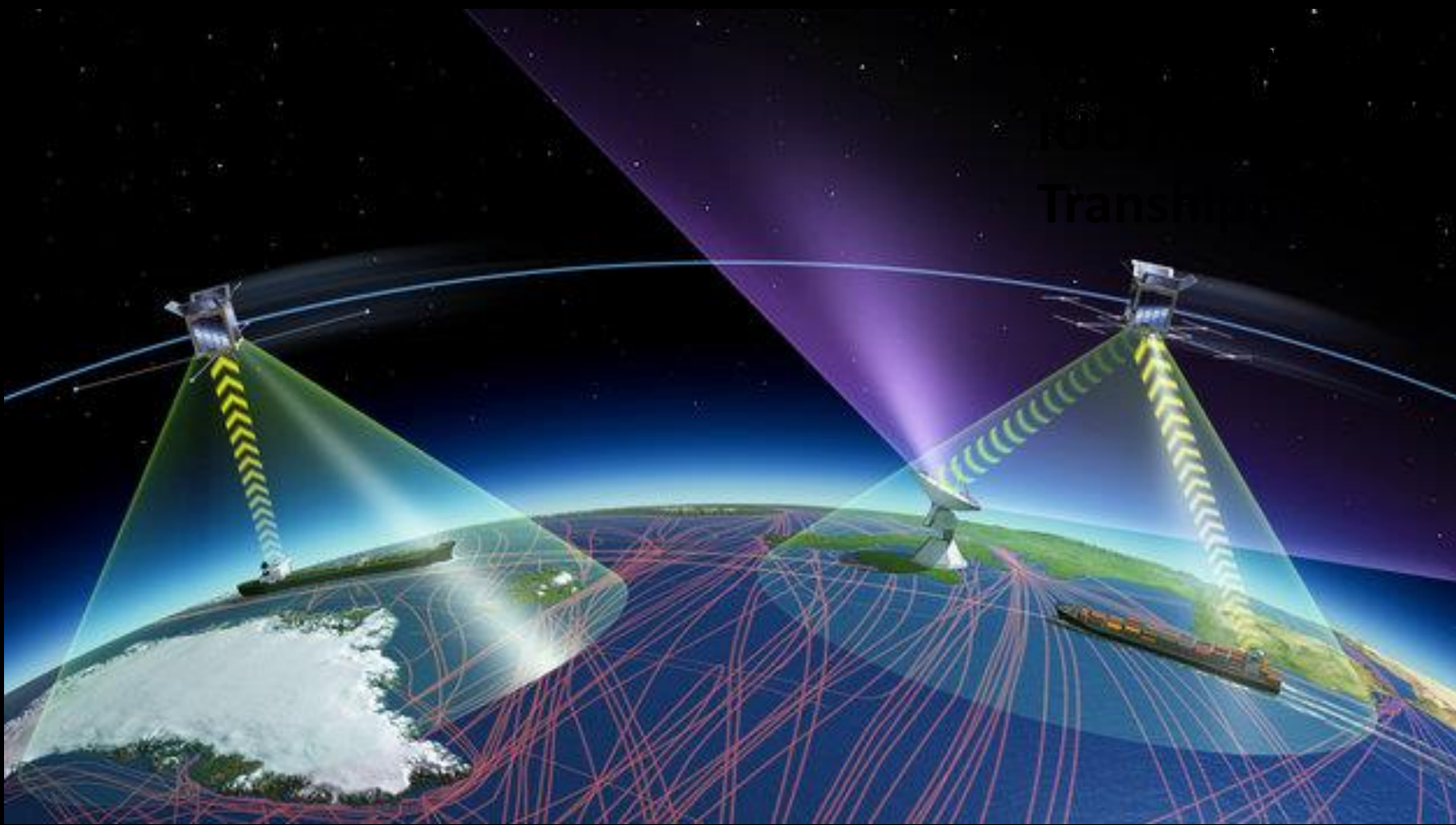
Ortuño Crespo et al, 2020. "Beyond Static Spatial Management: Scientific and legal considerations for dynamic management in the high seas," *Marine Policy* <https://doi.org/10.1016/j.marpol.2020.104102>

Measures for ecosystems and migratory corridors too big for an MPA or where productivity or species aggregation may be seasonal



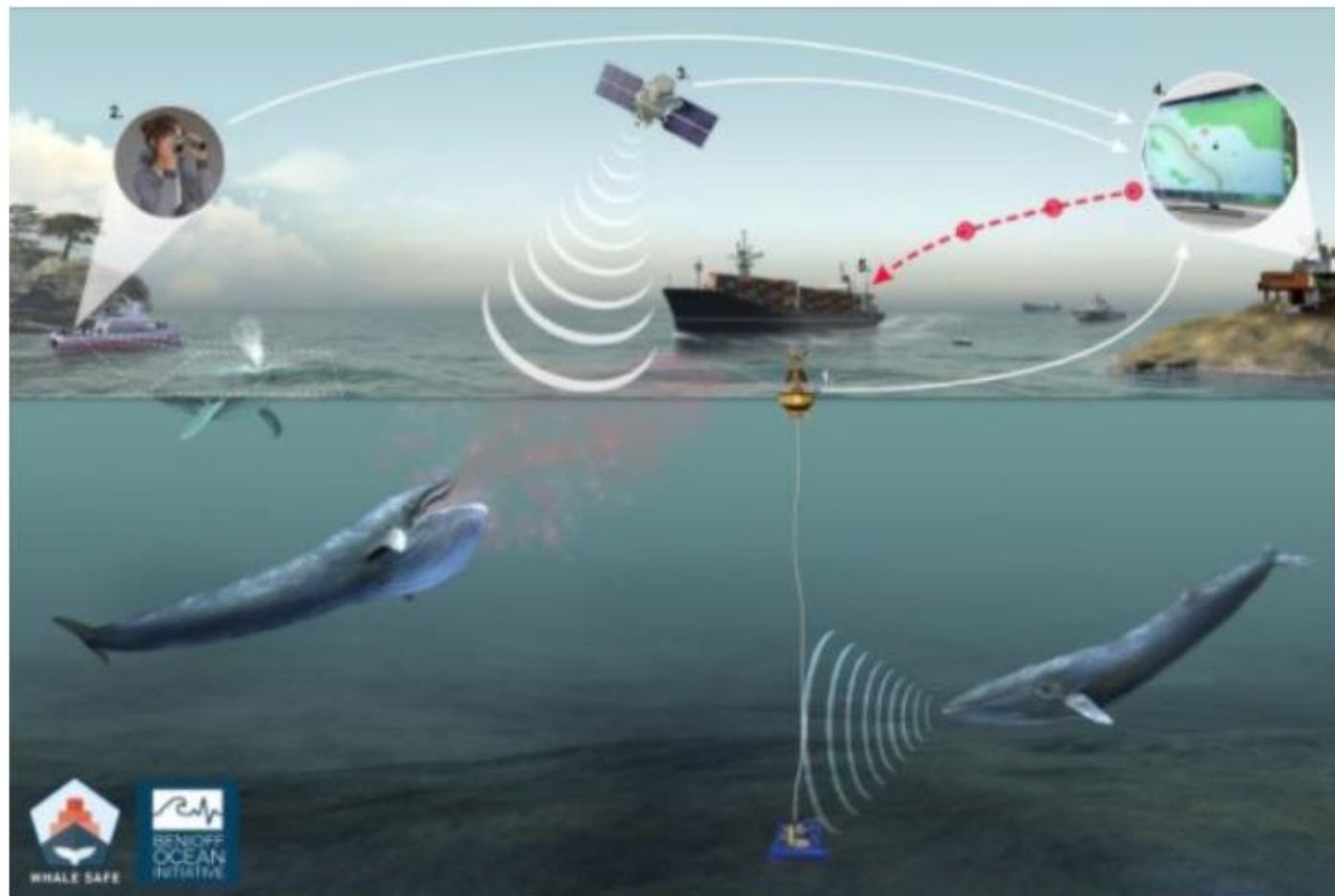
Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors, Sources: Esri, GEBCO, NOAA, National Geographic, DeLorme, HERE, Geonames.org, and other contributors

Satellite tracking can follow fishing effort



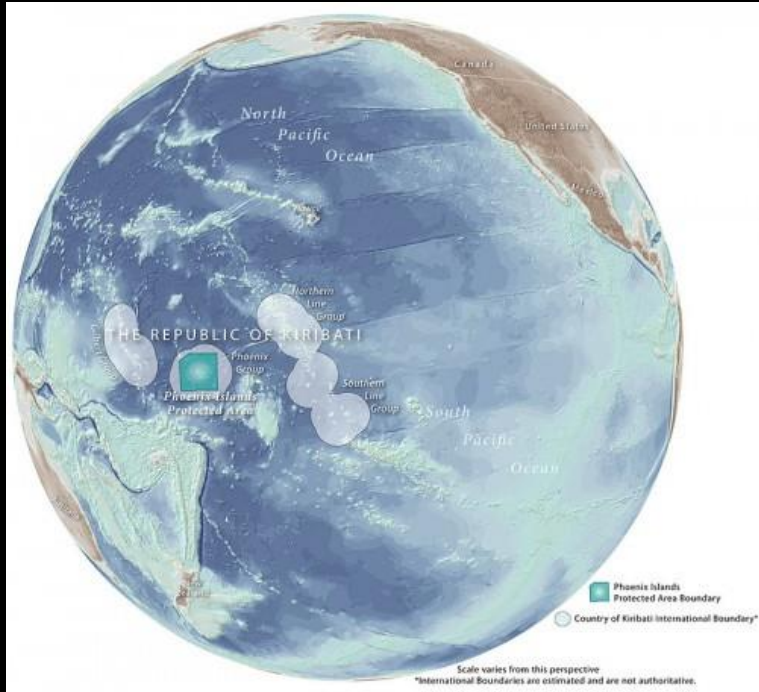
New means to enhance access to migratory connectivity data

Can be combined to advance EBM, protect connectivity, and safeguard migratory species



Whale Safe integrates three whale detection technologies and Global Fishing Watch data to provide data insights in near real-time.

Tracking fishing effort using satellite-based AIS data



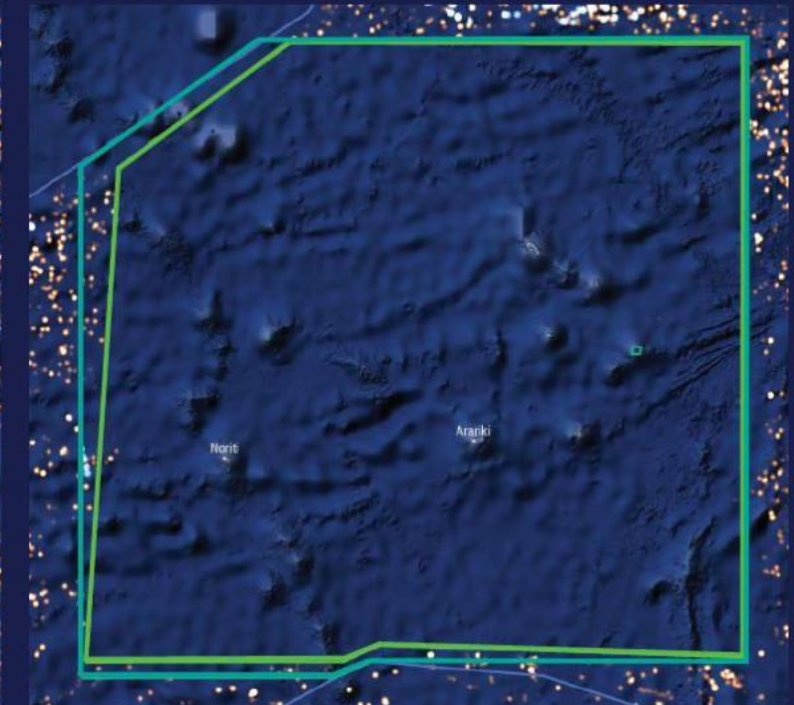
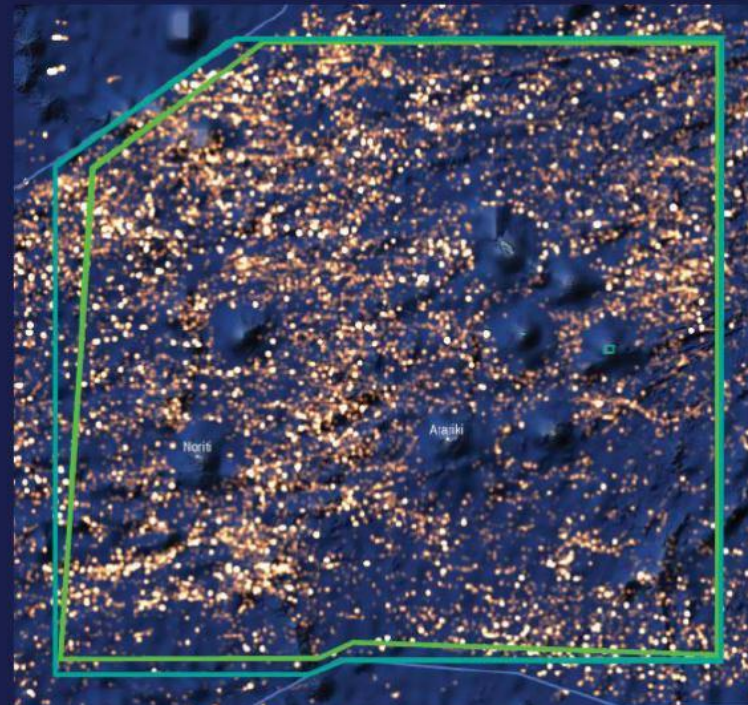
Phoenix Islands Protected Area (PIPA)

Fishing before MPA protection

Fishing after MPA protection

January - October 2014

January - October 2015



Allows us to track how well management measures are working

Dunn et al. 2018

Source: Global Fishing Watch

Empowering high-seas governance with satellite vessel tracking



Received: 5 June 2017 | Accepted: 20 February 2018
DOI: 10.1111/faf.12285



GHOTI

WILEY FISH and FISHERIES

Empowering high seas governance with satellite vessel tracking data

Daniel C Dunn¹ | Caroline Jablonicky² | Guillermo O Crespo¹ |
Douglas J McCauley² | David A Kroodsma³ | Kristina Boerder⁴ |
Kristina M Gjerde⁵ | Patrick N Halpin¹

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³Global Fishing Watch, Washington, DC, USA

⁴Biology Department, Dalhousie University, Halifax, NS, Canada

⁵IUCN Global Marine and Polar Programme, World Commission on Protected Areas, Cambridge, MA, USA

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Funding information
Nippon Foundation-Nereus Program

Abstract

Between 1950 and 1989, marine fisheries catch in the open-ocean and deep-sea beyond 200 nautical miles from shore increased by a factor of more than 10. While high seas catches have since plateaued, fishing effort continues to increase linearly. The combination of increasing effort and illegal, unreported and unregulated (IUU) fishing has led to overfishing of target stocks and declines in biodiversity. To improve management, there have been numerous calls to increase monitoring, control and surveillance (MCS). However, MCS has been unevenly implemented, undermining efforts to sustainably use high seas and straddling stocks and protect associated species and ecosystems. The United Nations General Assembly is currently negotiating a new international treaty for the conservation and sustainable use of biodiversity beyond national jurisdiction (BBNJ). The new treaty offers an excellent opportunity to address discrepancies in how MCS is applied across regional fisheries management organizations (RFMOs). This paper identifies ways that automatic identification system (AIS) data can inform MCS on the high seas and thereby enhance conservation and management of biodiversity beyond national jurisdictions. AIS data can be used to (i) identify gaps in governance to underpin the importance of a holistic scope for the new agreement; (ii) monitor area-based management tools; and (iii) increase the capacity of countries and RFMOs to manage via the technology transfer. Any new BBNJ treaty should emphasize MCS and the role of electronic monitoring including the use of AIS data, as well as government–industry–civil society partnerships to ensure critically important technology transfer and capacity building.



GHOTI papers

GHOTI aims to serve as a forum for stimulating and pertinent ideas. GHOTI publishes succinct commentary and opinion that addresses important areas in fish and fisheries science. GHOTI contributions will be innovative and have a perspective that may lead to fresh and productive insight of concepts, issues and research agendas. All GHOTI contributions will be selected by the editors and peer reviewed.

Etymology of GHOTI

George Bernard Shaw (1856–1950), polymath, playwright, Nobel prize winner, and the most prolific letter writer in history, was an advocate of English spelling reform. He was reportedly fond of pointing out its absurdities by proving that 'fish' could be spelled 'ghot'. That is: 'gh' as in 'rough', 'o' as in 'woman' and 't' as in 'patience'.

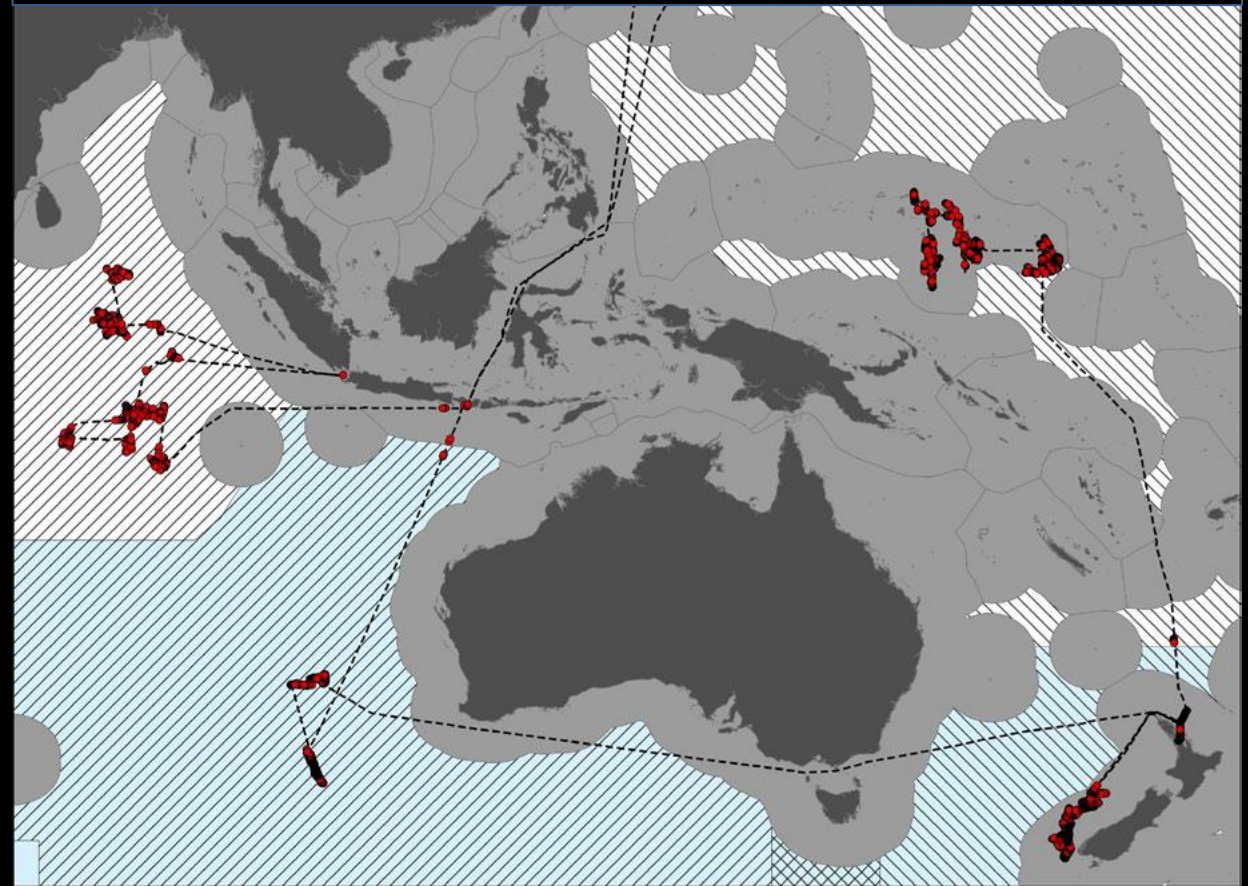
This is an open access article under the terms of the Creative Commons Attribution-NonCommercial License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

© 2018 The Authors. Fish and Fisheries Published by John Wiley & Sons Ltd.

Fish and Fisheries, 2018, 1–11.

wileyonlinelibrary.com/journal/faf | 1

Allows us to track who is using resource in and around large MPAs



• Fishing activity - - - - - Vessel track ■ EEZ ▨ IOTC ▩ WCPFC □ CCSBT

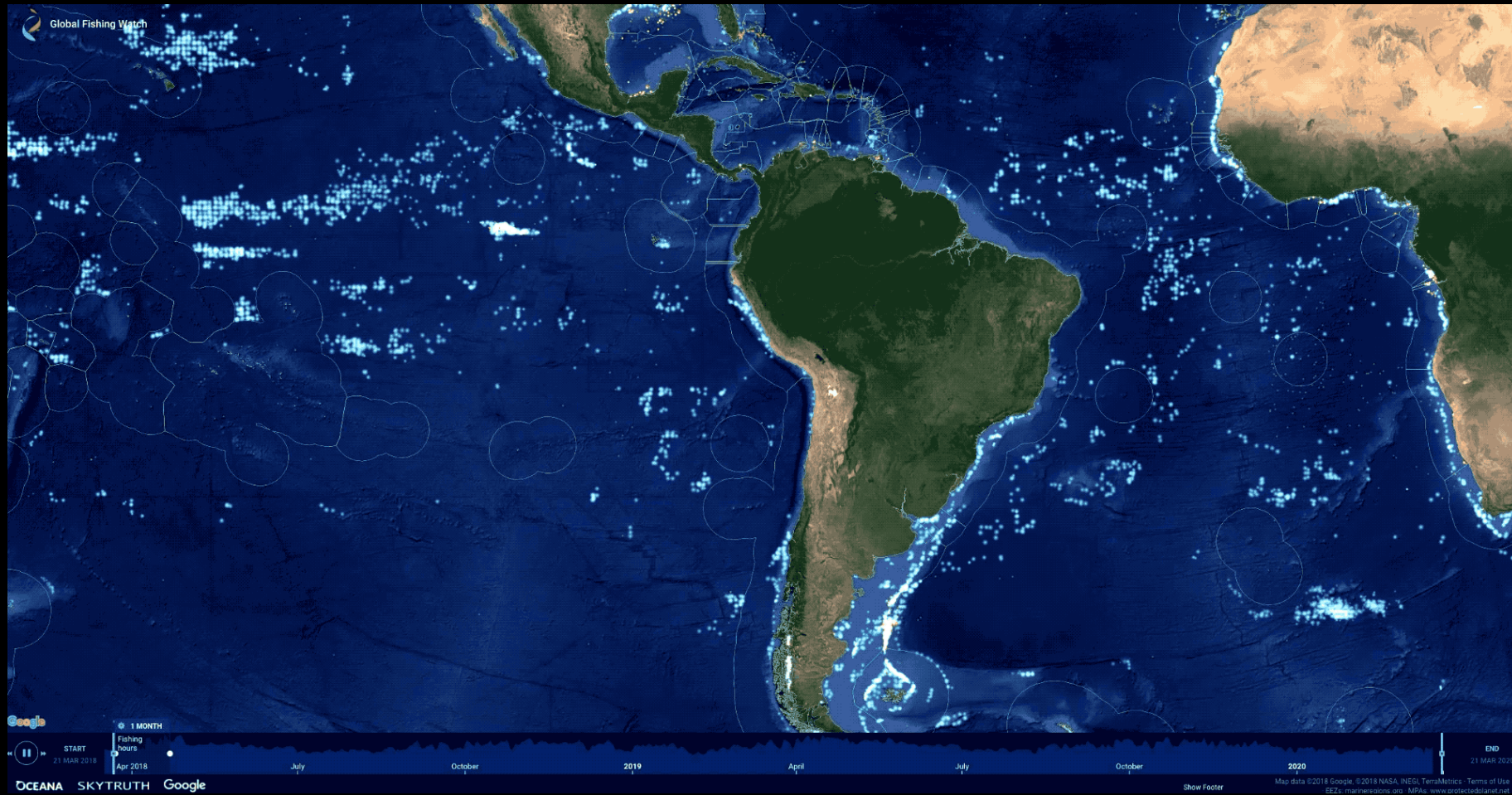
“Access to public vessel authorization and identification and tracking data provides industry operators and producers that follow the rules with an opportunity to demonstrate their compliance”



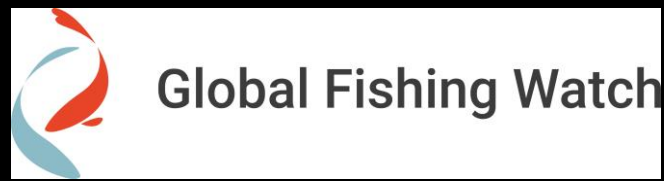
Martin Exel, managing director of Seafood Business for Ocean Stewardship (SeaBOS), speaks on the importance of the seafood industry's role in promoting transparency and sustainability.

<https://globalfishingwatch.org/news-views/seafood-sector-transparency>

Enhancing global cooperation for monitoring, control and enforcement



<https://globalfishingwatch.org/map/>



Summary: Key roles for the BBNJ Agreement: Building ecological and institutional resilience

MPAs and other ABMTs

```
graph TD; A[MPAs and other ABMTs] --> B[EIAs & Strategic Environmental Assessments]; B --> C[Consultation and Coordination]; C --> D[Data & Technology]; D --> E[Ocean Science & Innovation];
```

EIAs & Strategic Environmental Assessments

Consultation and Coordination

Data & Technology

Ocean Science & Innovation



Area-Based Management
Tools in Marine Areas Beyond
National Jurisdiction:

Building ambition,
broadening
participation and
planning ahead

A Report of the IUCN Workshop
entitled "Area-Based Management
Tools in Marine Areas Beyond
National Jurisdiction" (ABMTs in
ABNJ) from 8-10 October, 2019 in
Gland, Switzerland



Government Offices of Sweden
Ministry of the Environment and Energy

Thank you for your attention!

Questions?

Kristina.gjerde@ eip.com.pl

More information:

<https://www.dosi-project.org/topics/biodiversity-beyond-national-jurisdiction-bbnj/>

<https://www.iucn.org/news/marine-and-polar/202006/building-ambition-high-seas-treaty-june-iucn-webinar-series-what-did-you-miss>

Upcoming IUCN webinar on Resilience and the BBNJ
Agreement: October 22