

MPA Short Course

1. Introduction to Marine Protected Areas (MPAs)

MPA Course Overview

You are here!



- 1. Introduction to MPAs**
2. MPAs around the world
3. MPAs in Ghana
4. MPA identification and regulation
5. MPA management planning & management
6. MPA monitoring
7. MPA & Marine Spatial Planning
8. Your Voice

Learning Objectives

An underwater scene featuring a vibrant coral reef. A large, colorful striped fish, possibly a Moorish Idol, is the central focus, surrounded by numerous smaller orange and yellow fish. The water is clear and blue.

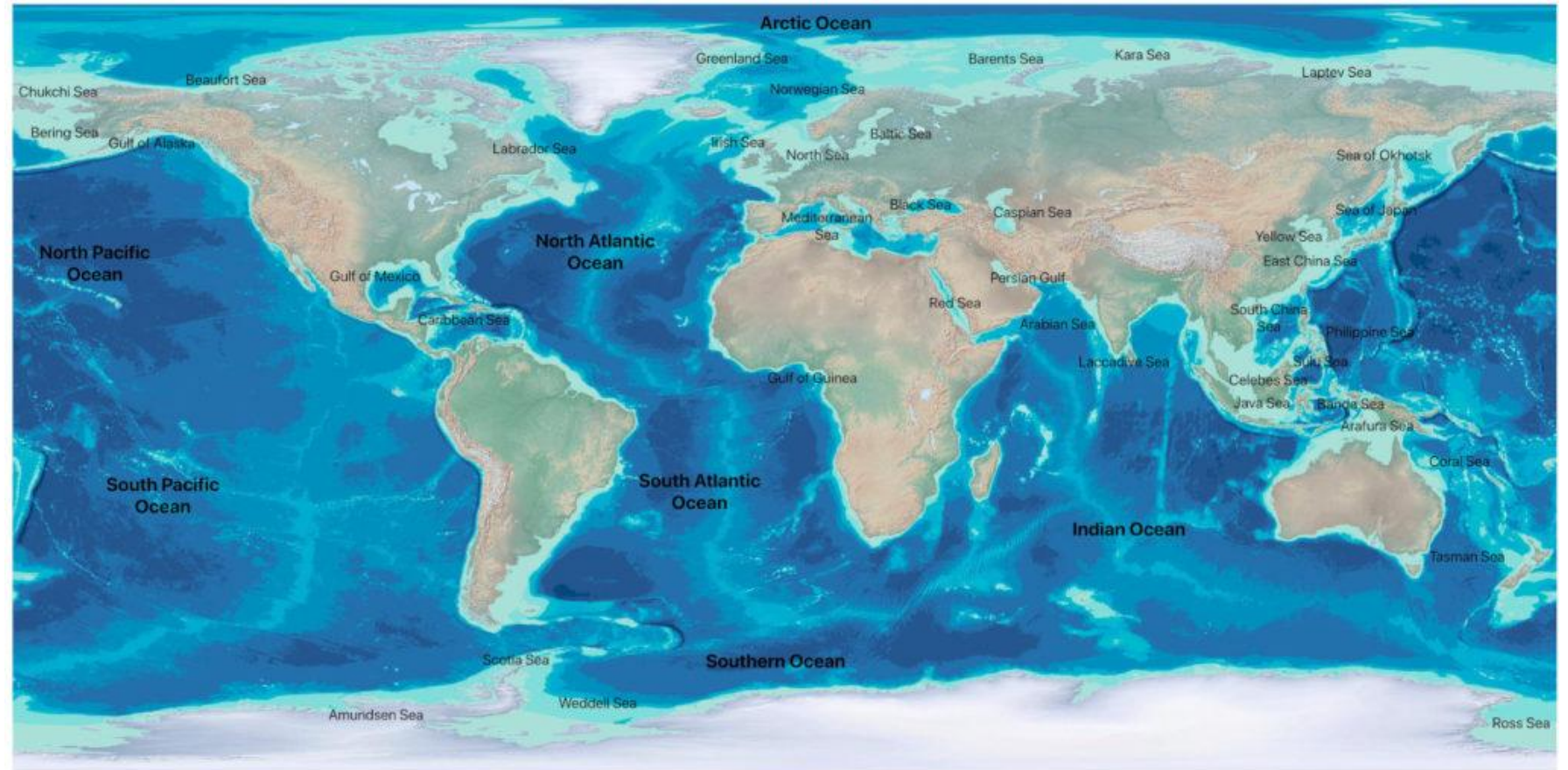
In this module you will gain the following:

- A brief overview of the global marine environment and the services it provides.
- An understanding of key threats to marine life
- An understanding of what Marine Protected Areas (MPAs) are, and their benefits and challenges.



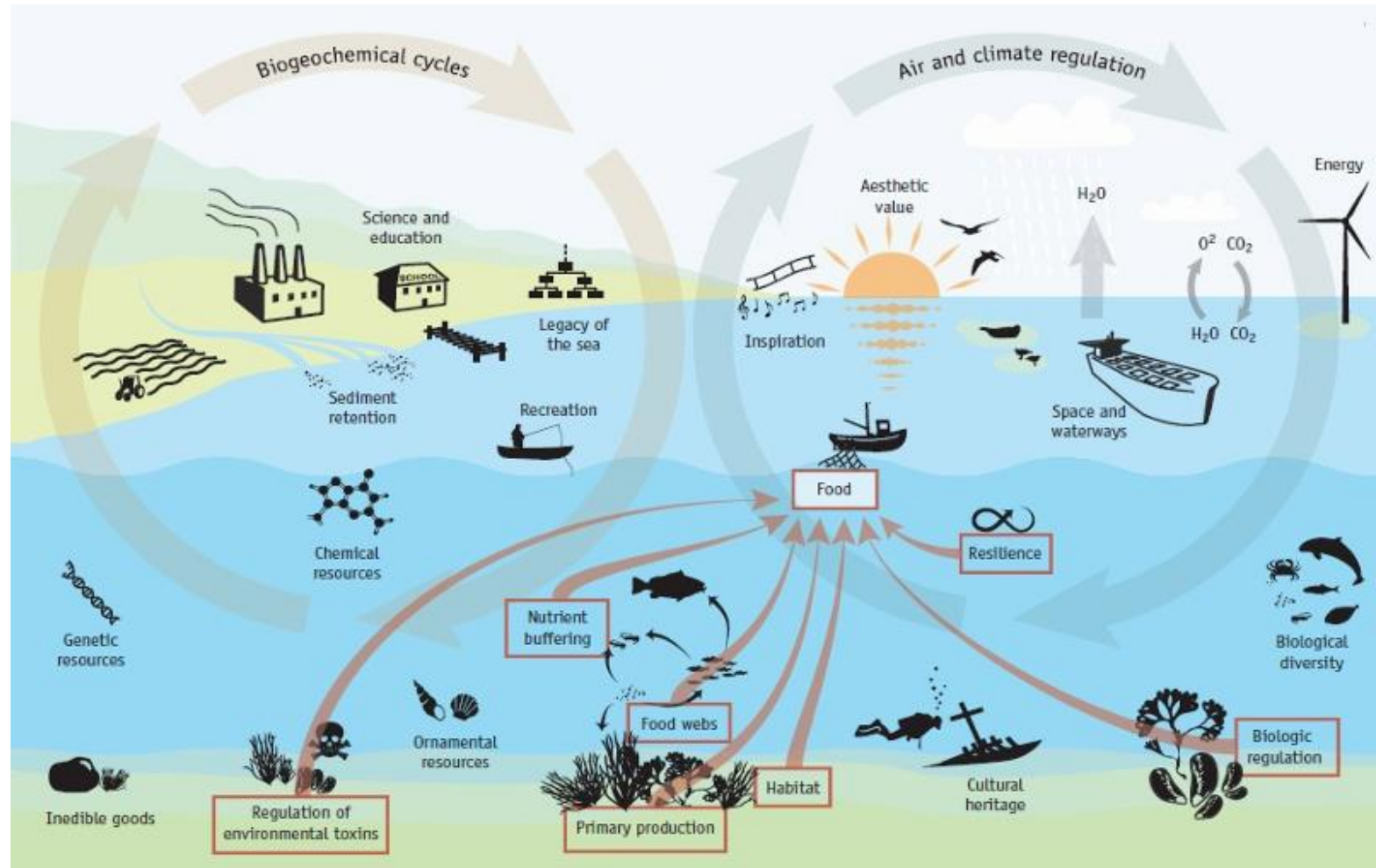
The Marine Environment

Covering 71% of Earth's Surface:
The ocean is the planet's largest ecosystem and is vital for human existence.

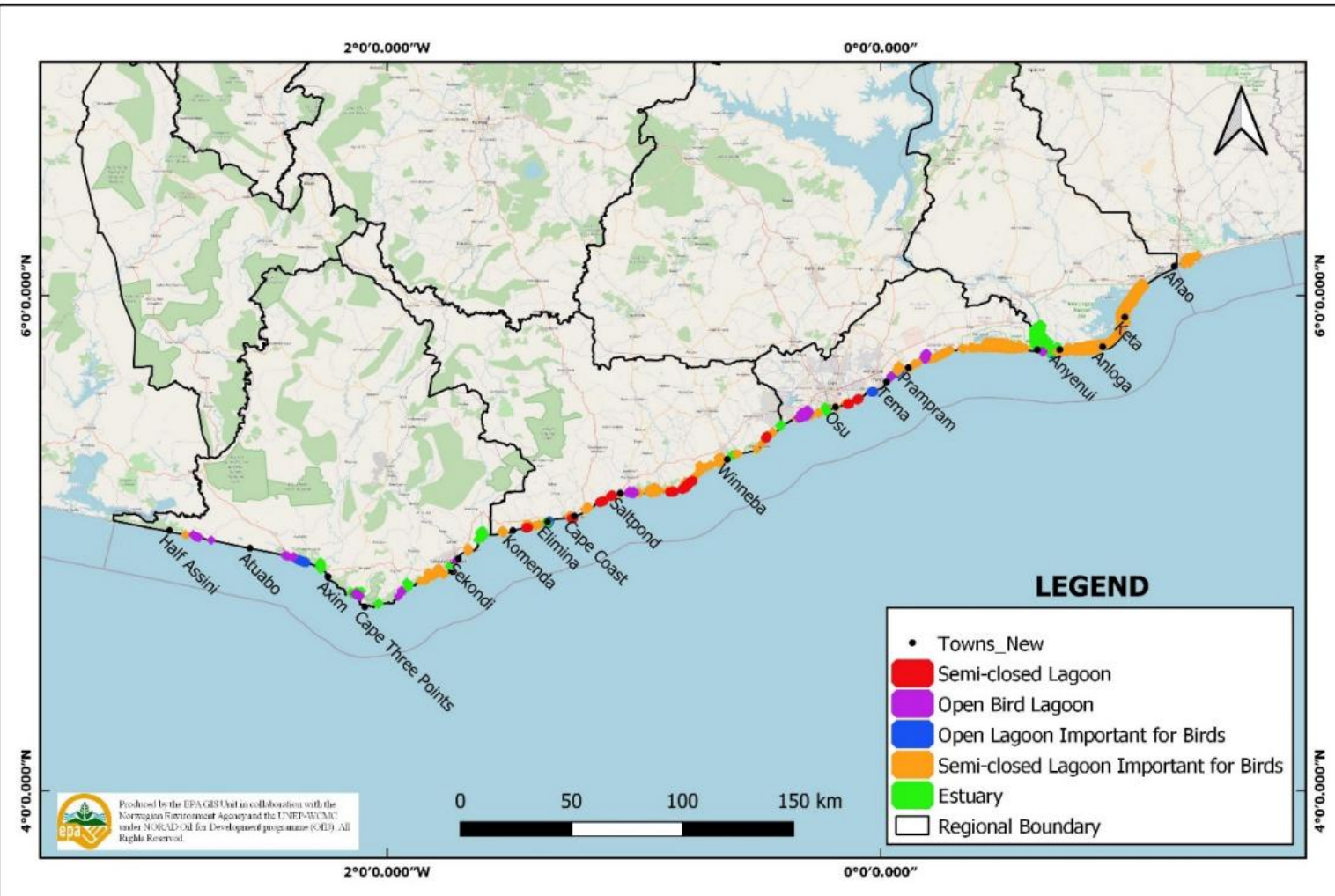


Marine Ecosystem Services

Provisioning Services	Food
	Fuel (oil & gas) & Biochemicals
	Genetic resources
Regulating Services	Air & Climate regulation
	Disease regulation
	Natural hazards
Cultural Services	Spiritual & Religious
	Knowledge systems & Educational value
	Recreation & Ecotourism
Supporting Services	Sediment formation
	Water cycling
	Nutrient cycling



Ghana's Marine Environment



Coastal ecosystems:

- Mangroves, beaches, wetlands, estuaries and lagoons.

Offshore marine ecosystems:

- Shelf seas, deep seas

Ecosystem services (coastal and offshore):

- Fisheries
- Nesting and feeding grounds
- Oil and gas reserves
- Aggregates (sand and gravel)

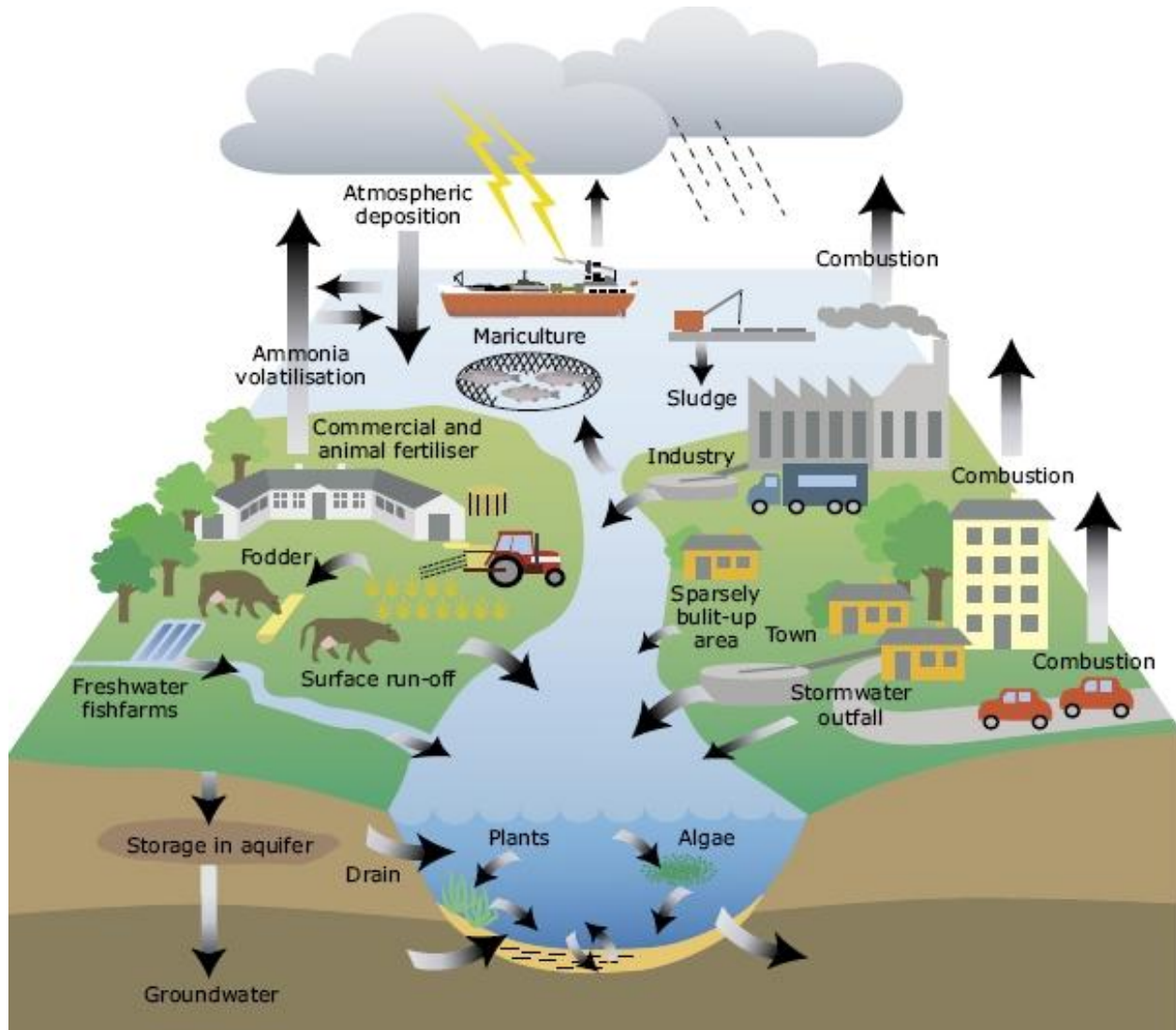
Threats to our Global Marine Environment

Play video -
<https://www.youtube.com/watch?v=uXIIPe7DAxw>

IPBES Global Assessment - The 5 Drivers of Change in Nature with the Largest Global Impacts



1. Changes to land and sea use

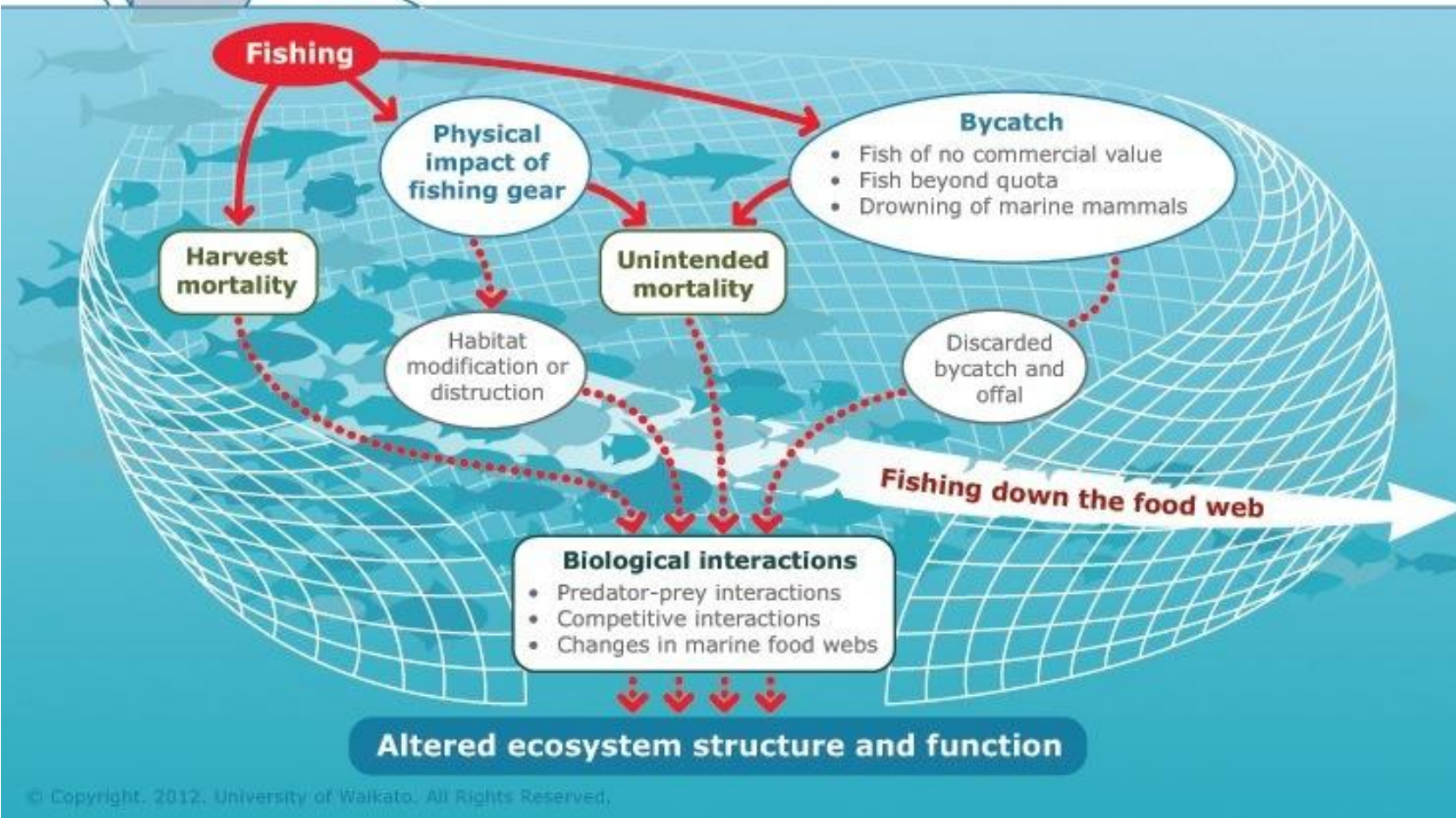


- Mineral and resource extraction
- Sand mining
- Oil and gas exploration
- Renewable energy exploration
- Deep-sea mining
- Aquaculture and mariculture
- Coastal development
- Tourism
- Genetic resource exploitation

2. Overexploitation of living resources

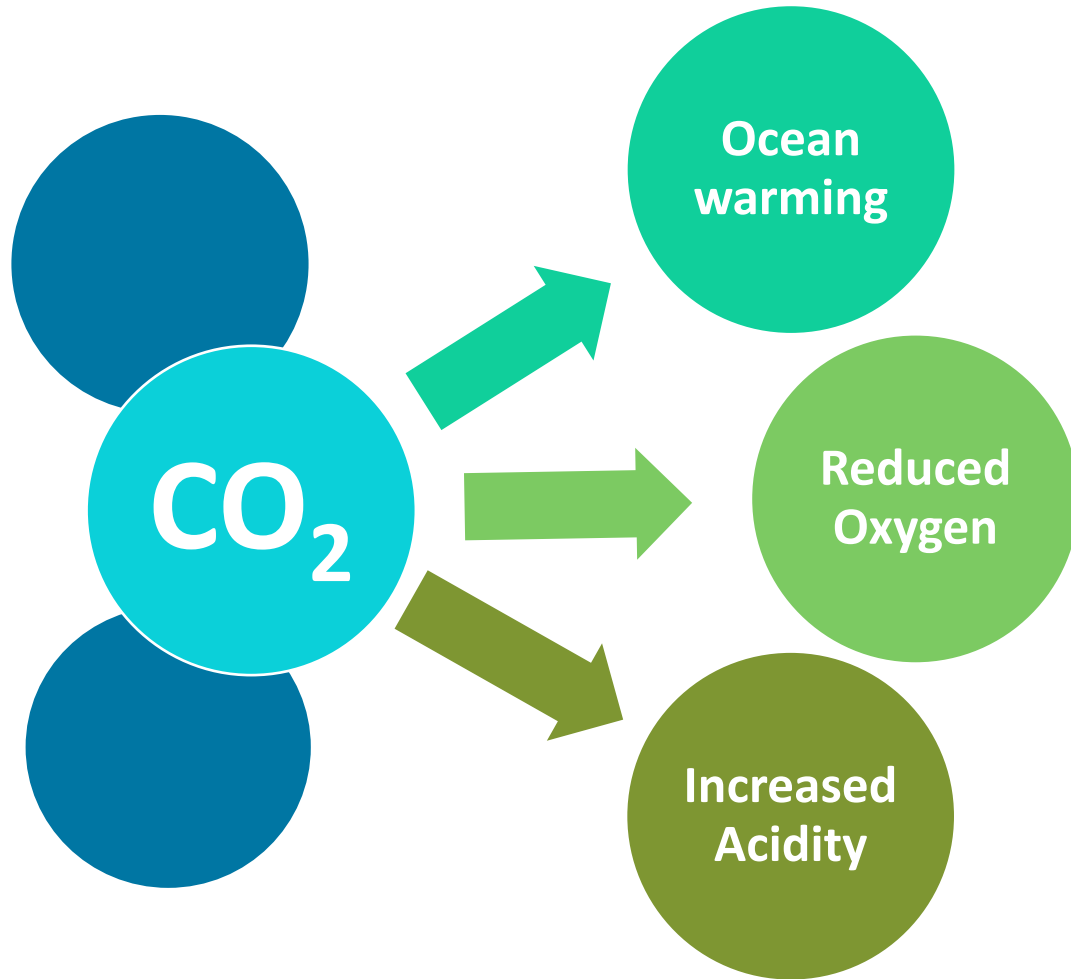


Ecosystem Overfishing



- Multiple pressures, not just the removal of target species
- Cascading effects throughout the food web
- Threatens livelihoods of coastal communities and those that depend on fisheries for sustenance and income

3. Climate change: the “deadly trio”



Sea level rise – increase impacts to coastal communities and wetland habitats



Bleaching– Increase in coral reef bleaching



Fisheries– warmer waters impact fish stocks and food webs



Habitats– species range shifts



Toxic algae– more frequent blooms, eutrophication



Ocean acidification– affecting calcification (Cnidaria, mollusks, echinoderms etc.)

4. Pollution

OCEAN POLLUTION

More than 80%
arises from land-
based sources

PLASTIC WASTE

1

OIL SPILLS

2

MERCURY

3

MANUFACTURED
CHEMICALS

4

PESTICIDES

5

NUTRIENTS

6

5. Invasive, Non-Native Species (INNS)

NATIVE	Species that occur naturally in a specified geographic area, in FL this is species present prior to European contact
NON-NATIVE	Species that do not occur naturally in a specified geographic area
INTRODUCED	Species brought to a new geographic area intentionally or unintentionally by humans
ESTABLISHED	Species having a self-sustaining and reproducing population without human intervention
INVASIVE	An established non-native species introduced by human activity that causes harm to the economy, environment, or human well being

Negative Effects:

- Competition for resources
- Alteration of habitats
- Uncontrolled change in food webs
- Disease introduction
- Economic Impact

Effects to Coastal Ecosystems & Communities



Habitat loss: mangroves, seagrasses, salt marshes



Sedimentation: can smother bottom dwelling organism



Water quality: introduction of nutrients and pollutants can lead to eutrophication, harmful algal blooms, oxygen depletion



Loss of buffer zones : coastal communities become more vulnerable to storms and flooding



Shifts in coastal dynamics: changes in currents, sediment transport, wave patterns which can impact habitats and ecosystems



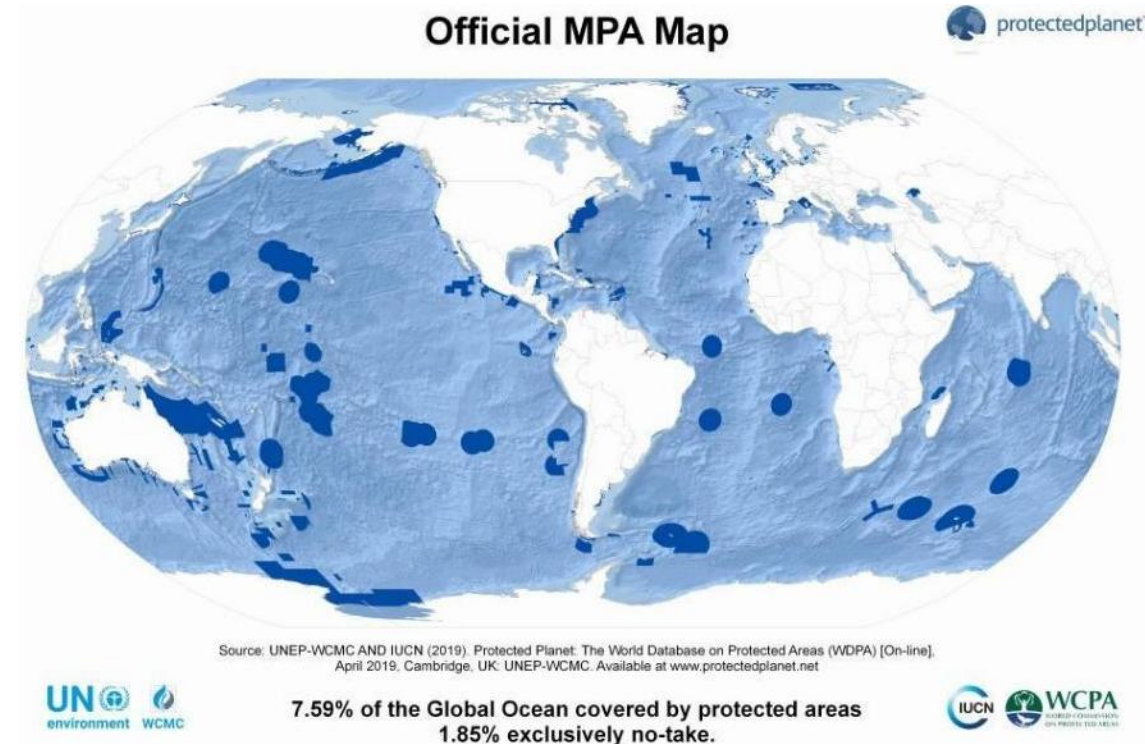
Impact ecosystem services, including fisheries: erosion can decrease the availability of breeding and fishing grounds for fish

Marine Protected Areas (MPAs)

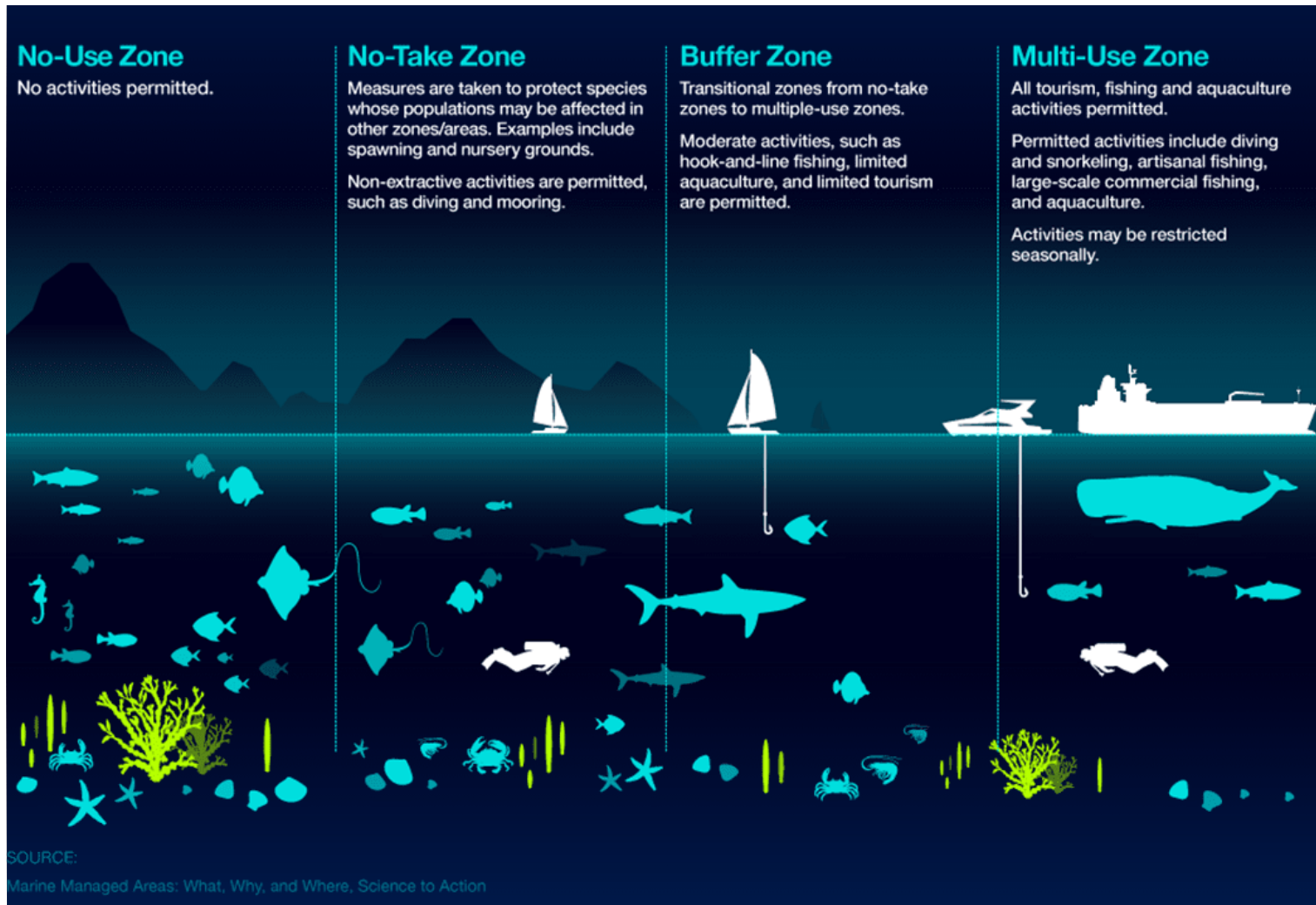
CBD definition: “A geographically defined area, which is designated or regulated and managed to achieve specific conservation objectives”.

IUCN definition: “A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values”.

WWF definition: “An area designated and effectively managed to protect marine ecosystems, processes, habitats, and species, which can contribute to the restoration and replenishment of resources for social, economic, and cultural enrichment”.



MPA characteristics

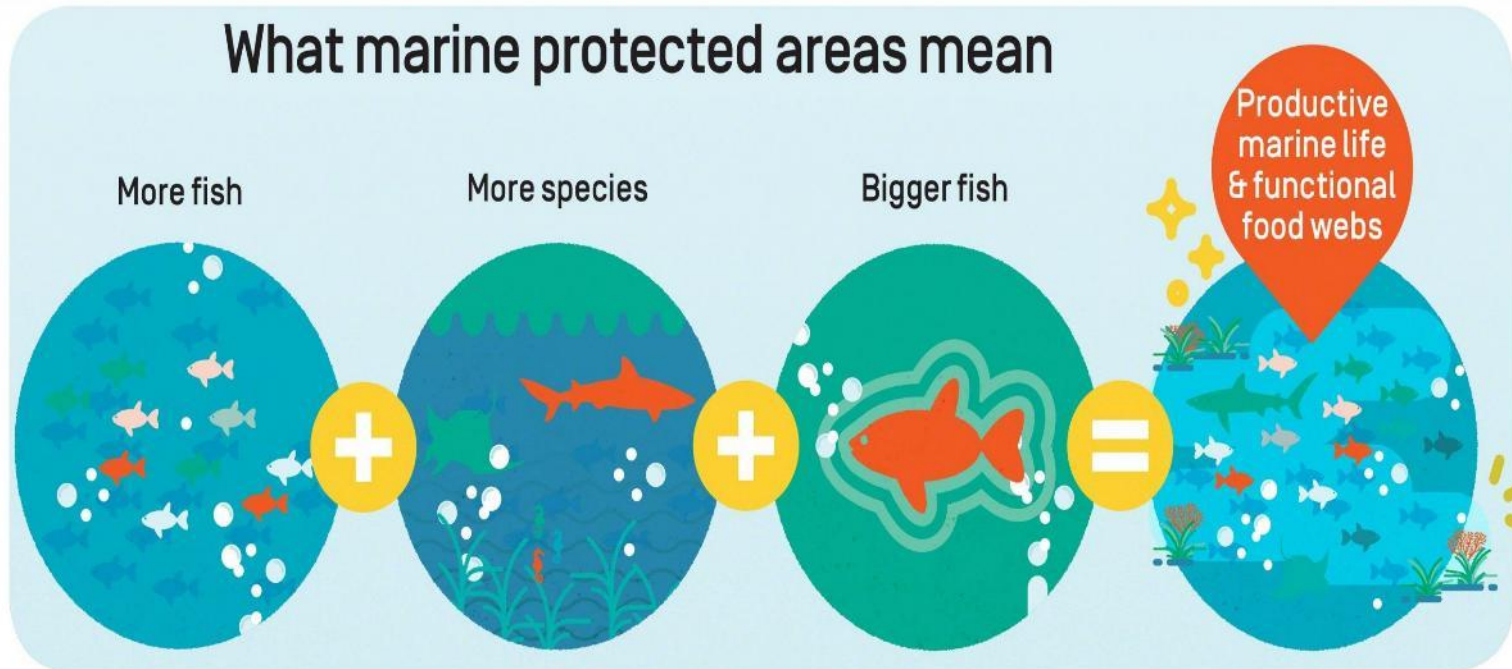


Key characteristics:

- Conservation purpose
- Spatial designation
- Active management
- Sustainable use
- Objectives
- Legal framework (not always)
- Global significance

A **tool** for ecosystem conservation and management of human activities.

MPAs: How do they work?



Source: Odyssea

Inside well-managed marine protected areas, there are more animals and plants, a greater diversity of species and bigger individuals. Together these mean more marine life, higher productivity, functional food webs and healthier ecosystems.

Key mechanisms:

- Regulation of activities
- Zoning
- Monitoring and Enforcement
- Community Involvement
- Adaptive management

MPAs: Environmental benefits

BENEFITS OF MPAs

Marine protected areas protect regions of ocean from human activities, so that biodiversity can thrive and support jobs, food security and our wellbeing.

FOR BIODIVERSITY

Protect essential habitats

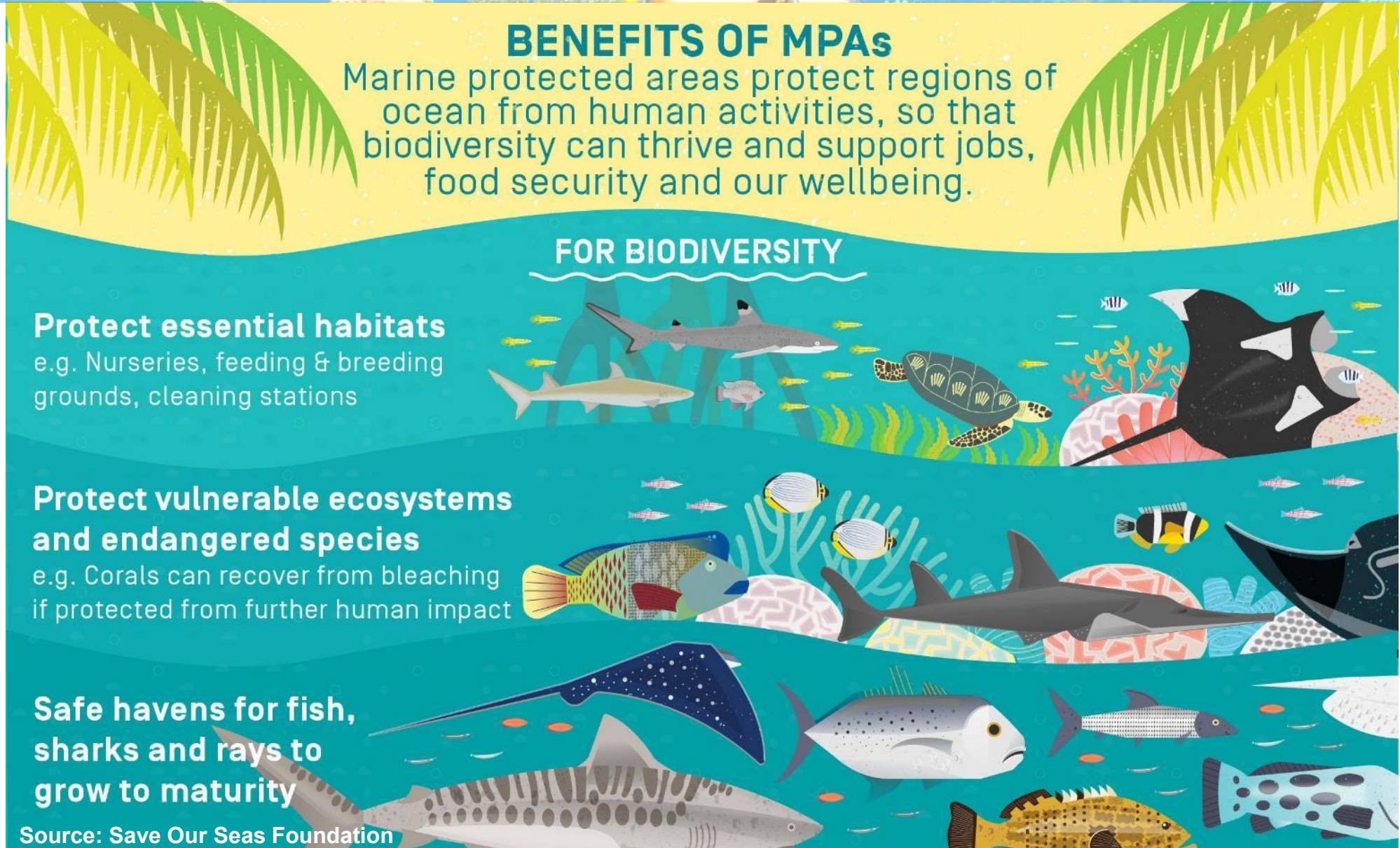
e.g. Nurseries, feeding & breeding grounds, cleaning stations

Protect vulnerable ecosystems and endangered species

e.g. Corals can recover from bleaching if protected from further human impact

Safe havens for fish, sharks and rays to grow to maturity

Source: Save Our Seas Foundation



MPAs: Economic benefits (Fisheries)

Economic benefits of MPAs for finfish, crustacean, and mollusc fisheries



Countries where benefits have been reported

- **39** studies found **increased catch since MPA designation**
- **13** studies found **increased body size up to 34%**
- **6** studies found **increased catch and body size**
- **0** studies reported **decreased catch**
- **8** studies reported **spillover of larvae and adults**

MPAs: Economic benefits (Tourism)

Economic benefits of MPAs for tourism

- **30 to 50 jobs per MPA**
- Up to **US\$2.7 million** from **entrance fees**, depending on MPA size and age
- Up to **US\$6.4 billion** from **one Marine Park**



Countries where benefits have been reported

- Up to **US\$7 million** from **scuba diving**
- Up to **US\$7 million** provided to **local economy**
- **Older MPAs** provide **higher total tourism revenues**



MPAs: Social benefits

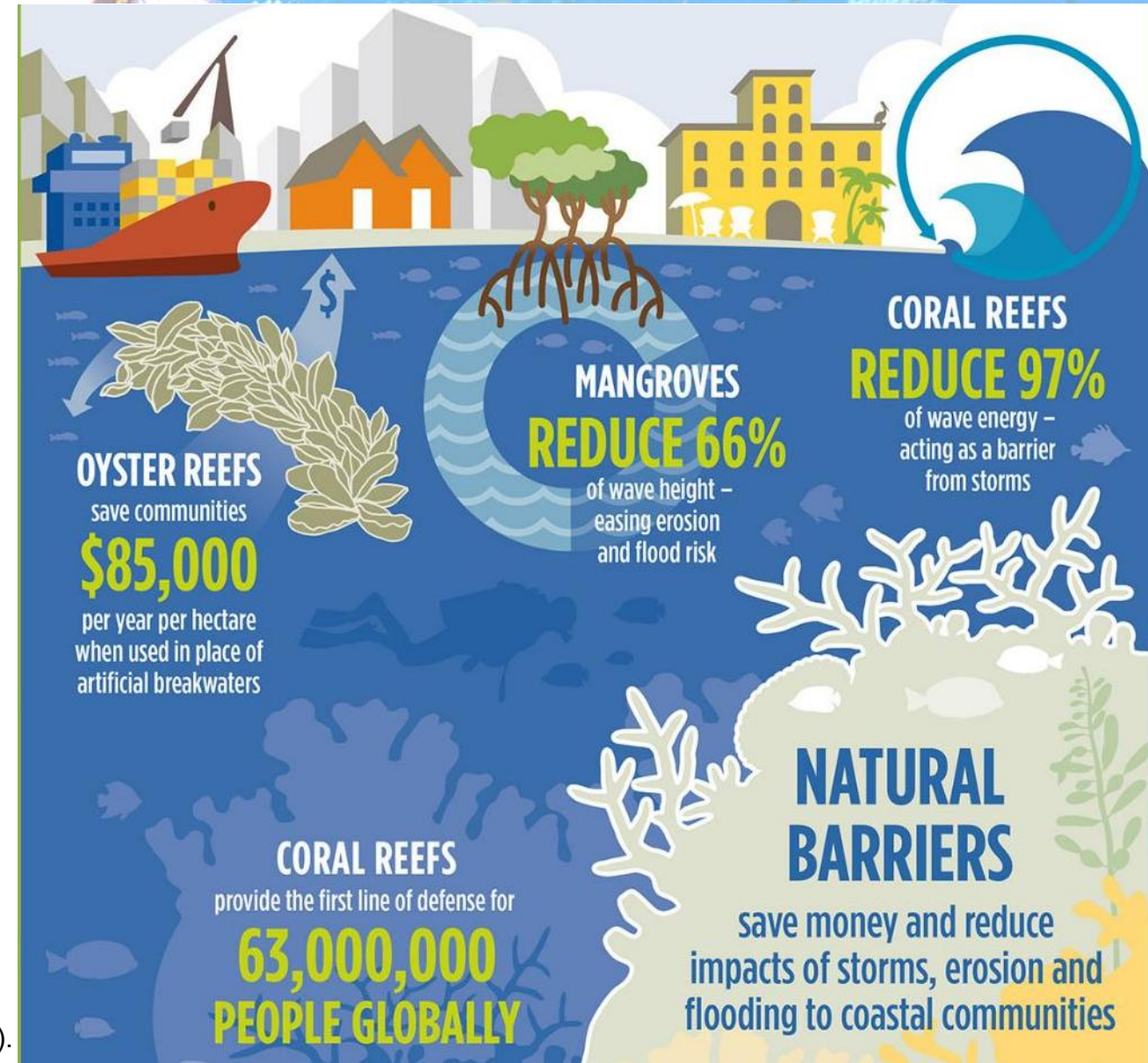
- Provide communities with a sense of pride for the importance of their local marine environment
- Protect and promote cultural heritage
- Enhance outreach and educational opportunities
- Provide research and monitoring opportunities



Credit: Henmopoano.org

MPAs: Climate Change & Habitat Resilience

- Protect blue carbon habitats such as seagrass, mangrove and saltmarsh
- Protect habitats that buffer against the impacts from extreme weather
- Provide corridors for species and habitats that are shifting due to climate change
- Enhance ecological resilience of marine ecosystems to impacts of climate change



Source: The Nature Conservancy (TNC).

Challenges of MPAs: Socioeconomic

Potential costs to communities:

- Loss of livelihoods due to restrictions on human activities in the MPA
- Loss of access to marine resources and potential increase in social conflict
- Undermining of social and cultural practices by reducing access to culturally significant places



Challenges of MPAs: Effectiveness

2 Major factors to MPA effectiveness: **Procedural** and **Substantive** (Gill *et al.*, 2017)

<u>PROCEDURAL</u>	<u>SUBSTANTIVE</u>
Budget capacity	Species or habitat condition
Staff capacity / presence	Status of environmental threats
Implementation of planned management activities	Wellbeing of affected communities
Degree of monitoring of management, users and / or resource conditions	Degree of social conflict
Level of enforcement	
Delineation of MPA boundaries	
Appropriateness of regulations controlling use	
Level of legislative support	

In summary



How MPAs help protect marine life?

MPAs help **rebuild • protect • sustain**
fishing, tourism and other biodiversity-based sectors,

by using human activity management to create a buffer to the pressures facing marine ecosystems. This creates healthy habitats for marine life, enabling fish and other marine species to grow and breed freely and ultimately restoring the balance of the ecosystem.

