



# MPAs, a Vehicle for Climate-Resilient and Sustainable Oceans

---

NEAMPAN Workshop on Advancing Marine Protected Areas for Climate Action, Biodiversity and Sustainable Development

11–12 November 2024  
First Institute of Oceanography  
Qingdao, China

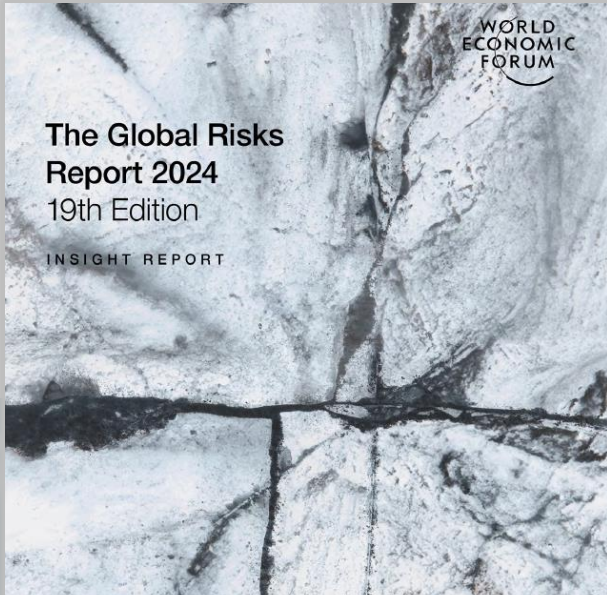
Jungho NAM [jhnam@kmi.re.kr](mailto:jhnam@kmi.re.kr)



한국해양수산개발원  
KOREA MARITIME INSTITUTE

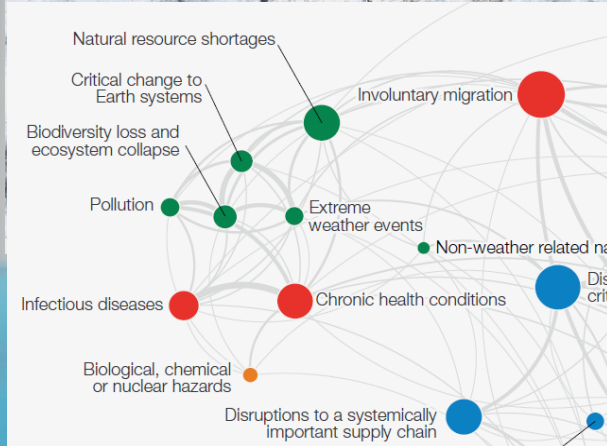
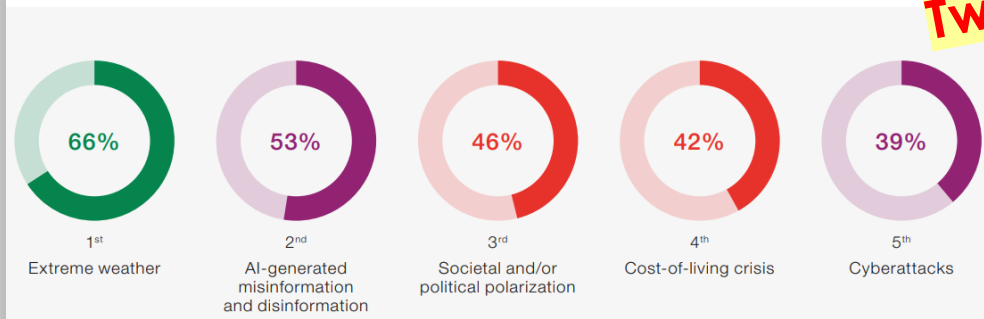
# Twin Crisis : Climate change and Biodiversity loss

## Natural ecosystems, past the point of no return?



### Current risk landscape

\*Please select up to five risks that you believe are most likely to present a material crisis on a global scale in 2024.\*



### Risk categories

- Economic
- Environmental
- Geopolitical
- Societal
- Technological

### 2 years



### 10 years



Source

World Economic Forum Global Risks Perception Survey 2023-2024.



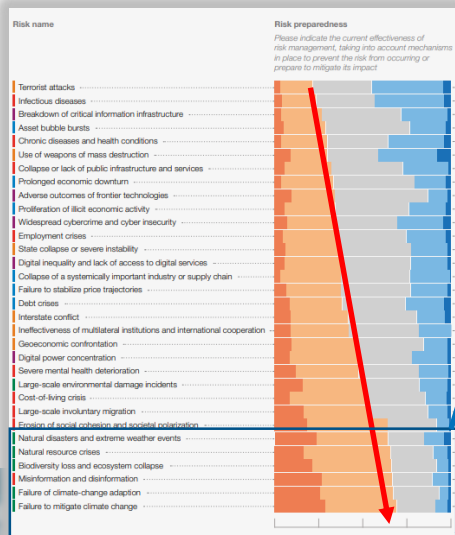
**Natural ecosystems: past the point of no return**

# Twin Crisis : Climate change and Biodiversity loss

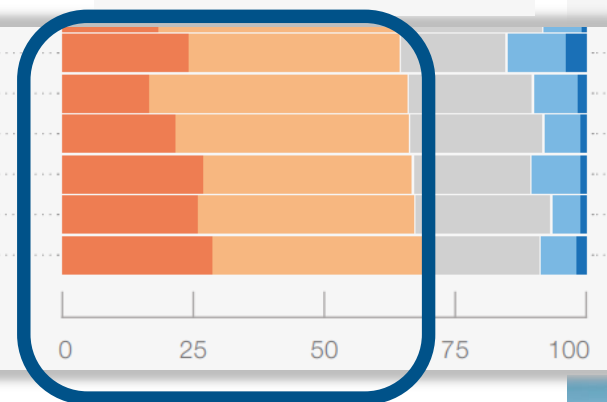
## Risk Preparedness, **INEFFECTIVE**

### Perception

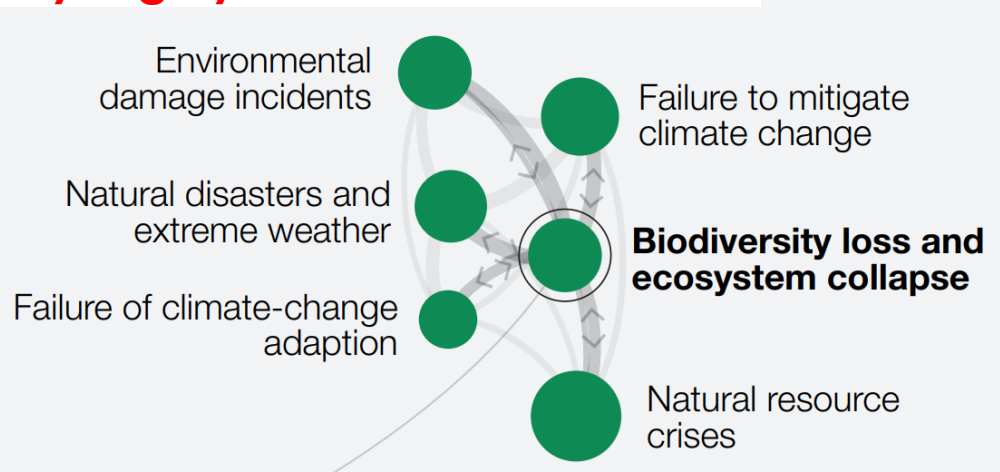
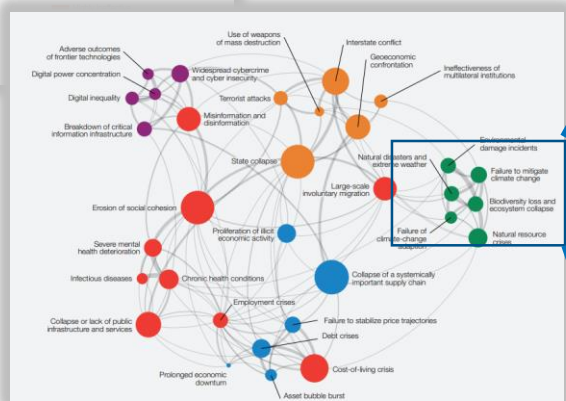
- Highly ineffective
- Ineffective
- Indeterminate effectiveness
- Highly effective
- Effective



- Natural disasters and extreme weather events
- Natural resource crises
- Biodiversity loss and ecosystem collapse
- Misinformation and disinformation
- Failure of climate-change adaption
- Failure to mitigate climate change



## Very Highly Interlinked Twin Crisis

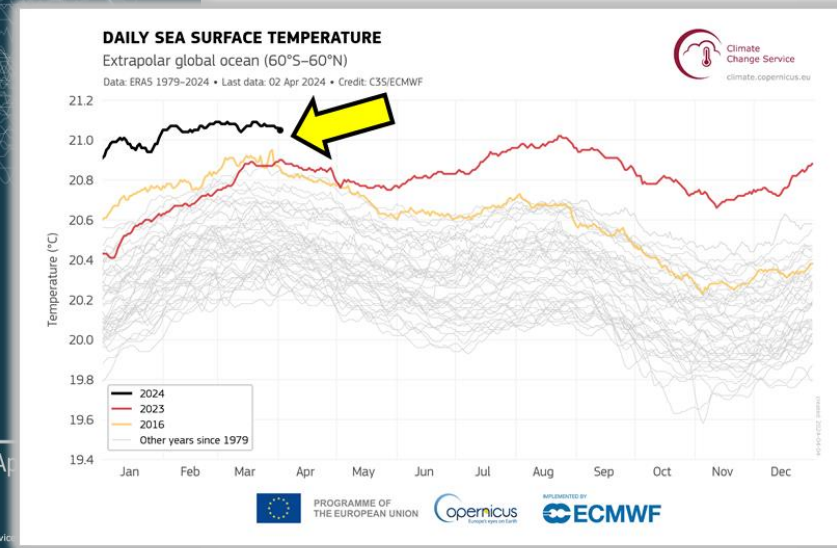
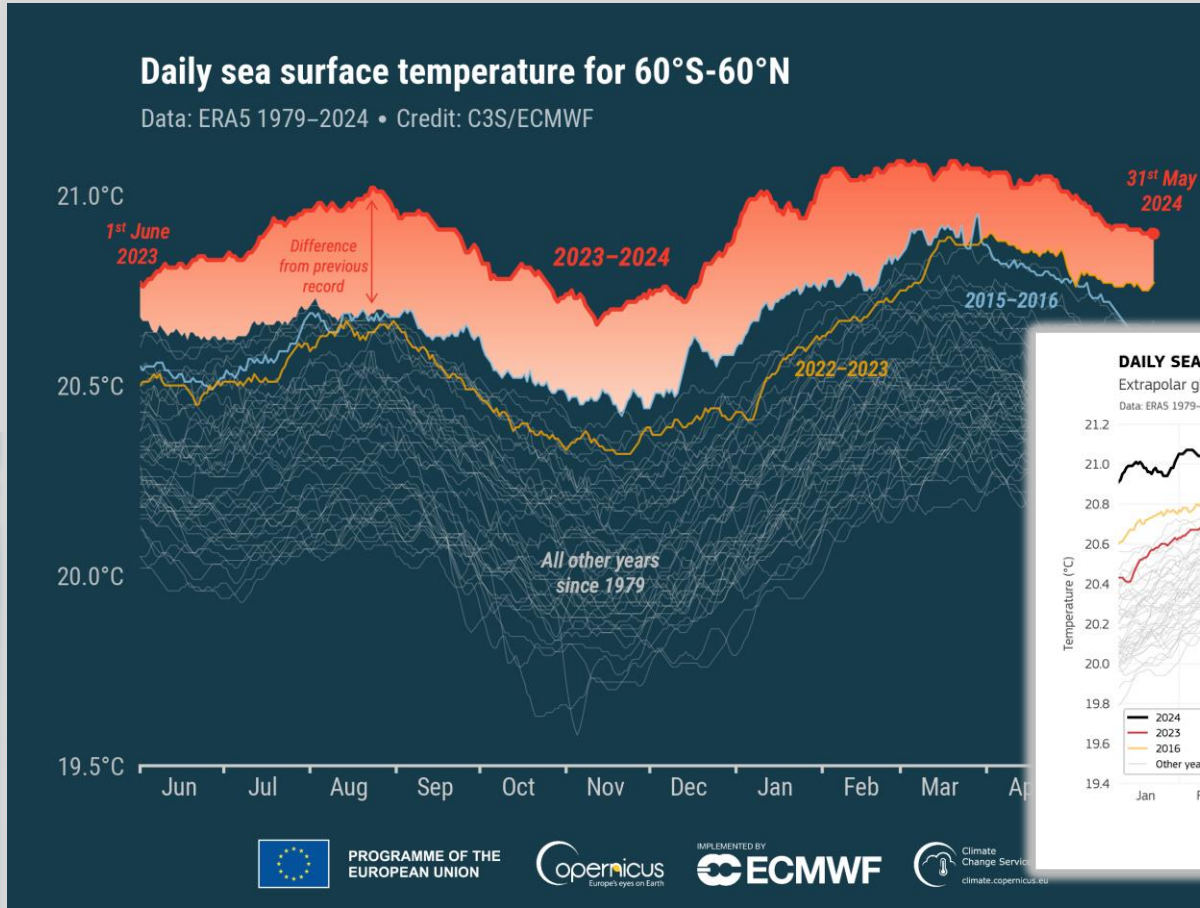


- Economic
- Environmental
- Geopolitical
- Societal
- Technological



# Twin Crisis : Climate change and Biodiversity loss

## Global Change driven by Climate Change



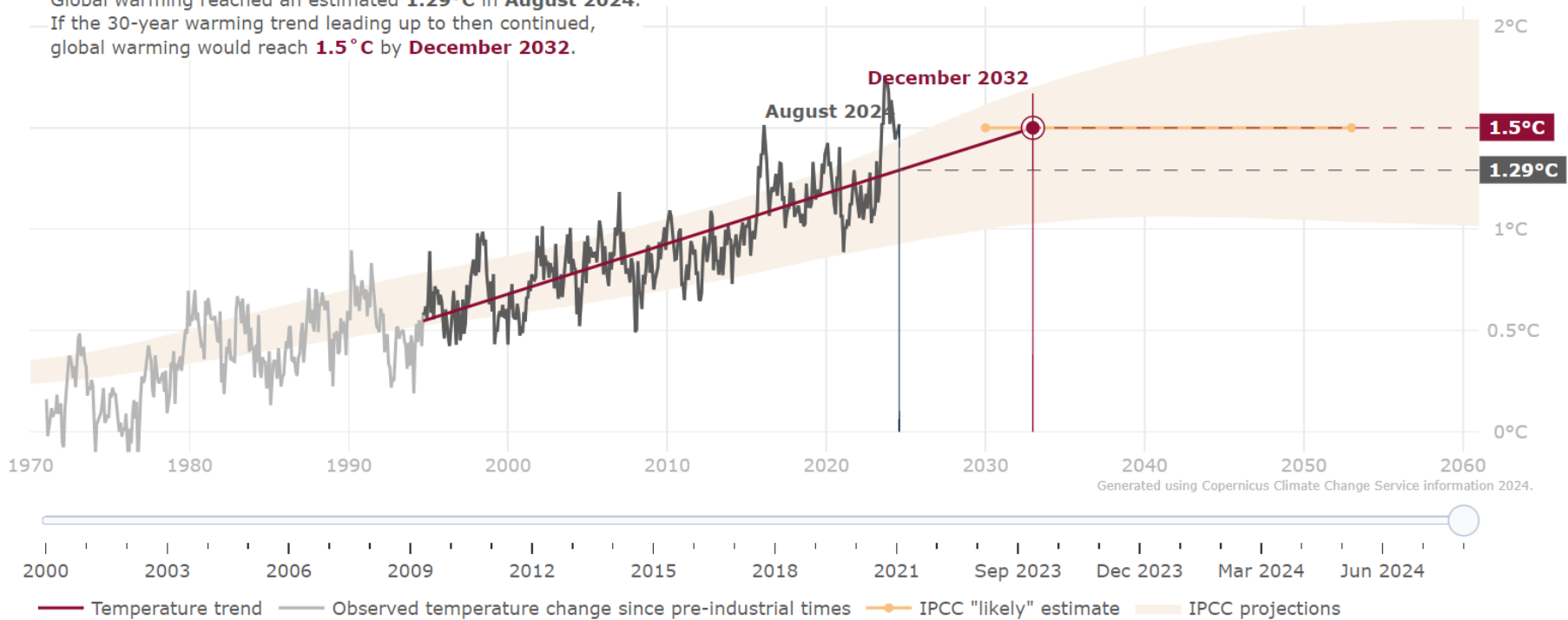
<https://climate.copernicus.eu/copernicus-may-2024-streak-global-records-surface-air-and-ocean-temperatures-continues>

# Twin Crisis : Climate change and Biodiversity loss

## Possibly reaching 1.5 °C by December 2032

Global warming reached an estimated **1.29°C** in **August 2024**.

If the 30-year warming trend leading up to then continued, global warming would reach **1.5°C** by **December 2032**.

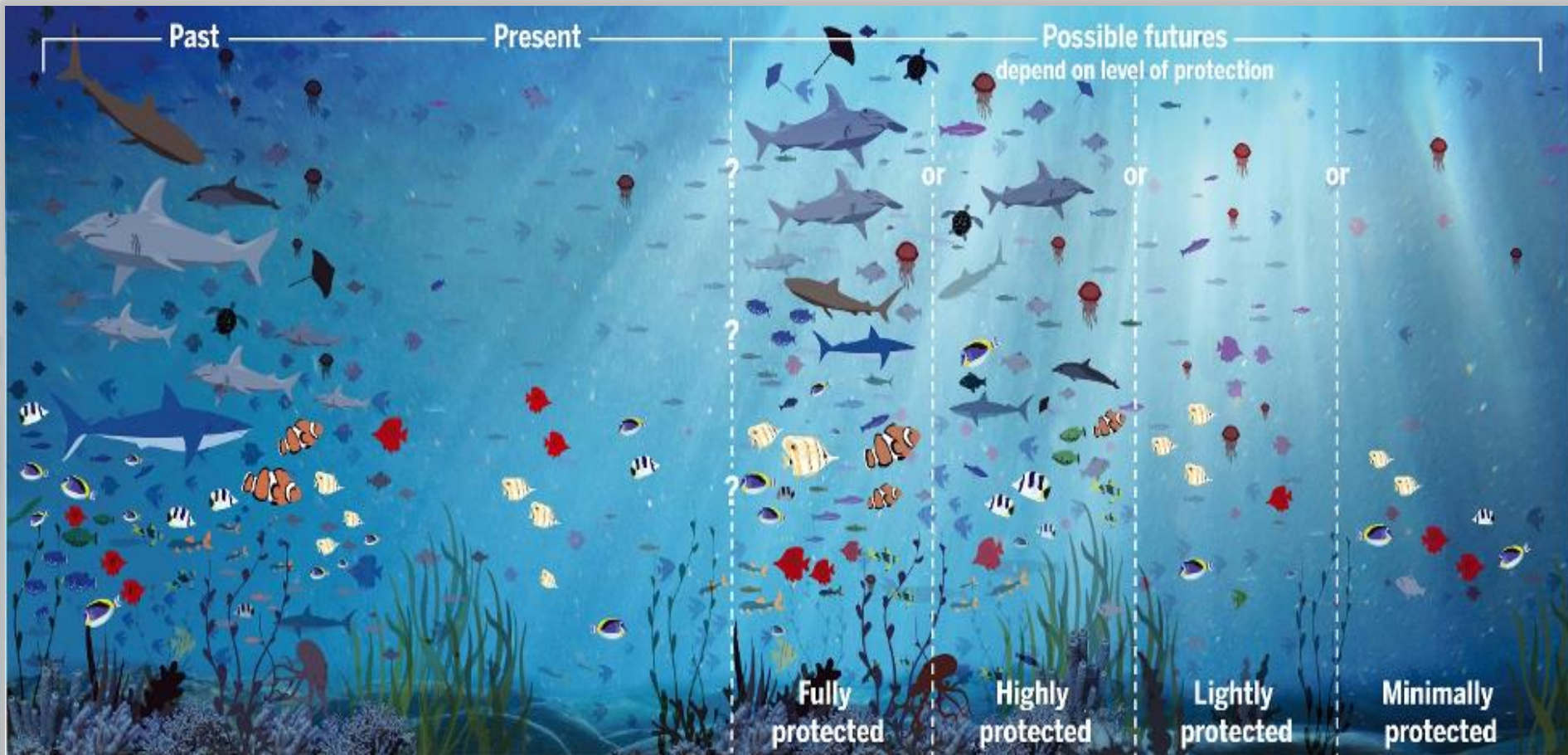


<https://climate.copernicus.eu/> (24 September, 2024)





# Resilience Enhancement is a Key



Grorud-Colvert et al. 2021, The MPA Guide

# Resilience Enhancement is a Key

## Threats to Marine Ecosystems

### *Anthropogenic & Climate-driven*



#### **COASTAL EUTROPHICATION:**

CAUSING ALGAL BLOOMS AND DEAD ZONES

### *Climate-driven*



#### **OCEAN ACIDIFICATION:**

30% HIGHER THAN IN PRE-INDUSTRIAL TIMES



#### **OCEAN WARMING:**

SEA-LEVEL RISE AND AFFECTING MARINE ECOSYSTEMS

### *Anthropogenic*



#### **PLASTIC POLLUTION:**

17 MILLION METRIC TONS IN 2021-2-3X MORE BY 2040



#### **OVER-FISHING:**

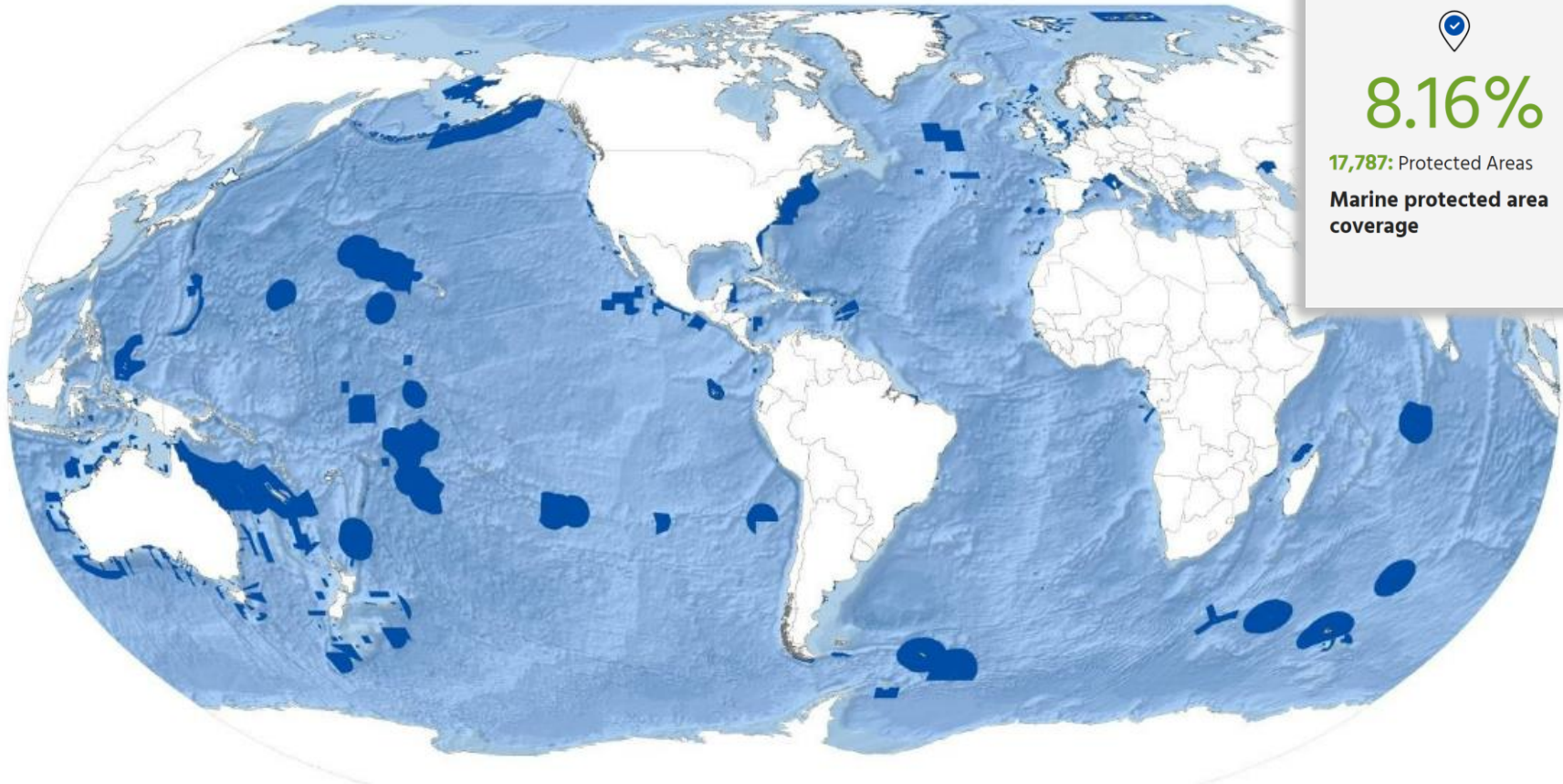
MORE THAN A THIRD OF GLOBAL FISH STOCKS ARE OVERFISHED

**Resilience Enhancement is a KEY**



# The Way Forward

## Official MPA Map



**8.16%**

**17,787**: Protected Areas  
**Marine protected area coverage**

Source: UNEP-WCMC AND IUCN (2017). Protected Planet: The World Database on Protected Areas (WDPA) [On-line], September, 2017, Cambridge, UK: UNEP-WCMC. Available at [www.protectedplanet.net](http://www.protectedplanet.net)



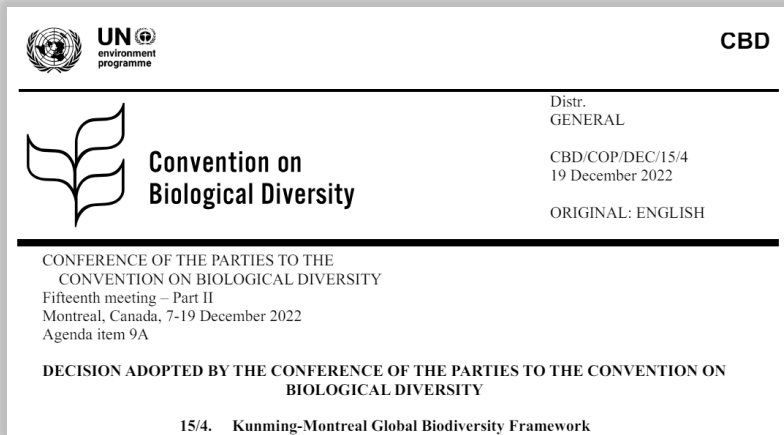
**6.35% of the Global Ocean covered by protected areas**  
**1.89% exclusively no-take.**



# The Way Forward

## More proactive efforts for 30X30 Target

- Kunming-Montreal Global Biodiversity Framework



CBD/COP/DEC/15/4 19 December 2022

## Reducing threats to biodiversity

Restoration

### TARGET 2

Ensure that by 2030 at least 30 per cent of areas of degraded terrestrial, inland water, and marine and coastal ecosystems are under effective restoration, in order to enhance biodiversity and ecosystem functions and services, ecological integrity and connectivity.

Protection

### TARGET 3

Ensure and enable that by 2030 at least 30 per cent of terrestrial and inland water areas, and of marine and coastal areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures, recognizing indigenous and traditional territories, where applicable, and integrated into wider landscapes, seascapes and the ocean, while ensuring that any sustainable use, where appropriate in such areas, is fully consistent with conservation outcomes, recognizing and respecting the rights of indigenous peoples and local communities, including over their traditional territories.

Global targets for 2030

Total of 23 targets

# The Way Forward



16.42%

284,421: Protected Areas  
Terrestrial and inland waters protected area coverage



8.33%

18,888: Protected Areas  
Marine protected area coverage



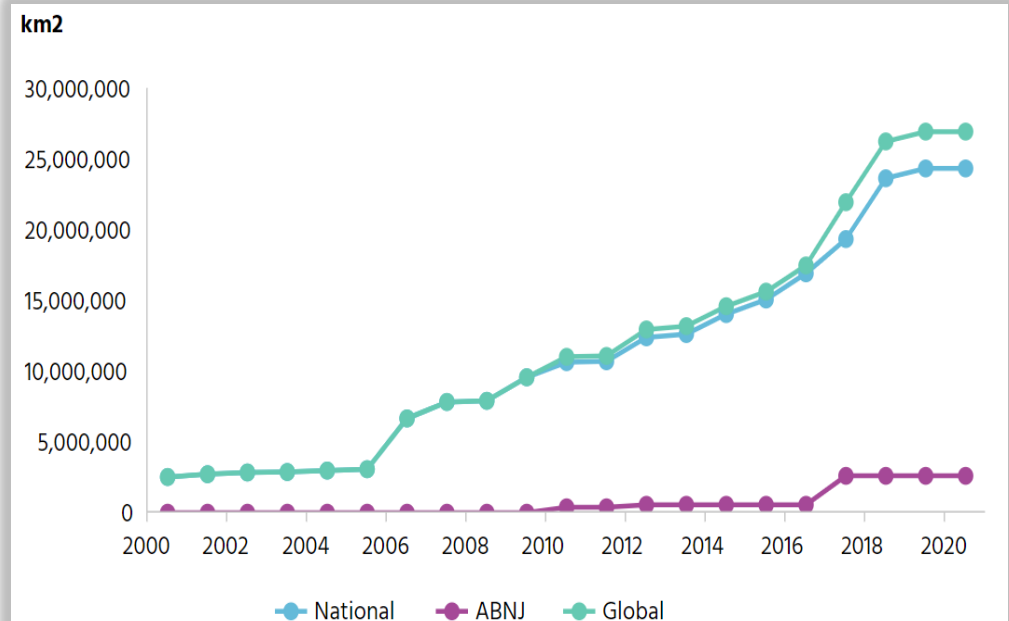
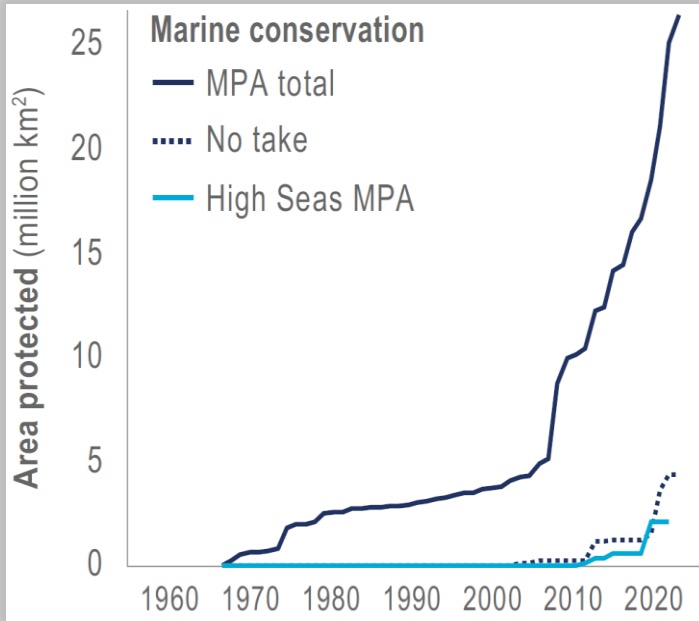
17.6%

284,421: Protected Areas  
6253: OECMs  
Terrestrial and inland waters protected area & OECM coverage



8.44%

18,888: Protected Areas  
211: OECMs  
Marine protected area & OECM coverage



Cooley et al., 2022, IPCC AR6 WGII

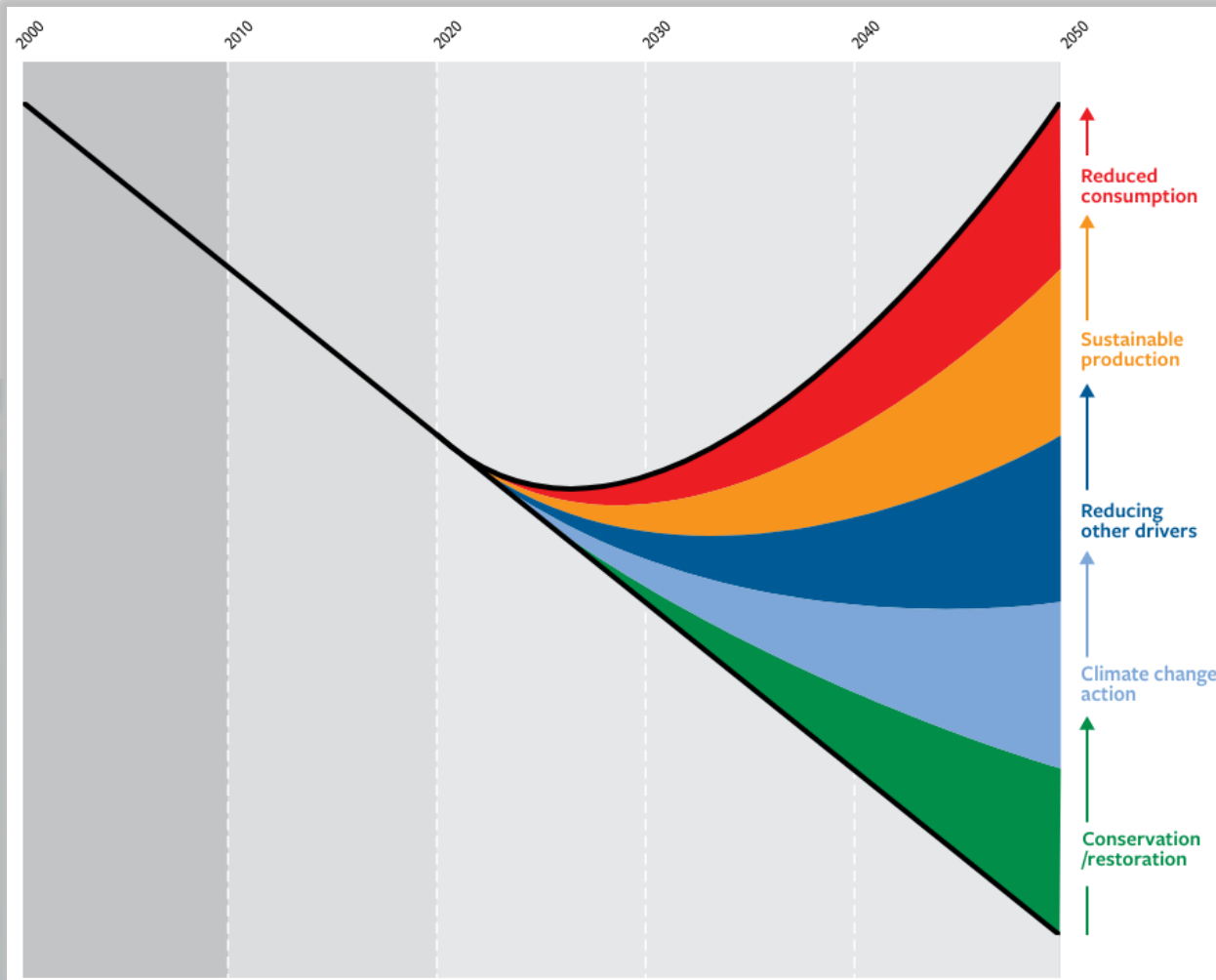
## Growth in Marine Protected Area Coverage

<https://www.protectedplanet.net/en/thematic-areas/marine-protected-areas>



# The Way Forward

## Application of Scenarios and pathways to 2050 at Global, regional, national and site levels



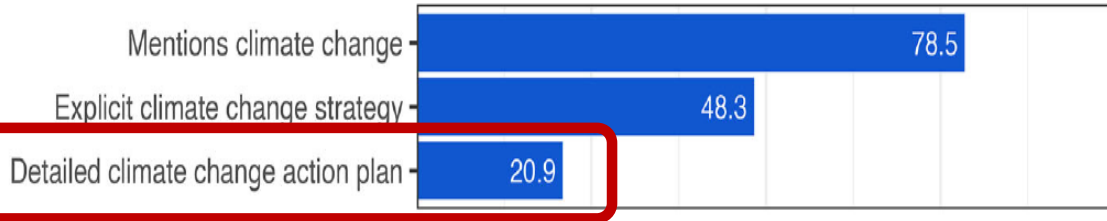
Secretariat of the Convention on Biological Diversity (2020) Global Biodiversity Outlook 5 - Summary for Policy Makers. Montréal.

- Reduced consumption
- Sustainable production
- Reducing other drivers
- **Climate change action**
- **Conservation / Restoration**

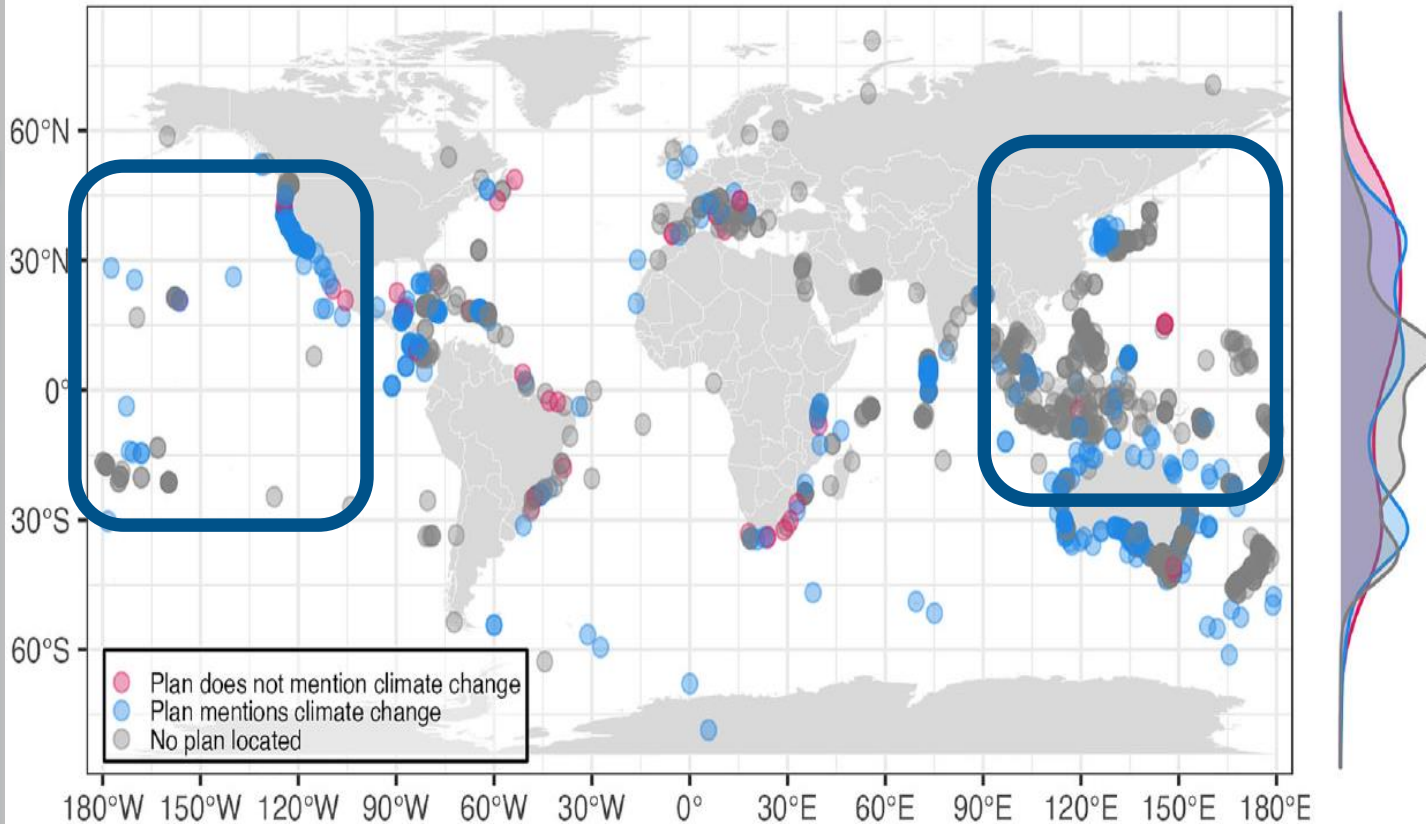
# The Way Forward

## Mainstreaming NbS and OBCA at implementation level

### Climate change



Analysis of 1609 MPAs



Lopazanski et al., 2023

# The Way Forward

## Addressing Paper Park Issues, and Strengthening MPAs Network

Addressing a critical issue in MPAs, **Paper Parks**  
( less than 3 Key Features of NEOLI)

**No-take**

- ✓ Only 4.6% of MPAs: all five features
- ✓ 5.7% of MPAs: four features

**Enforced well**

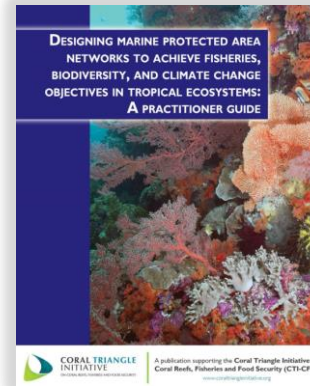
**Old (> 10 years)**

**Large (> 100 km<sup>2</sup>)** : small one is more vulnerable

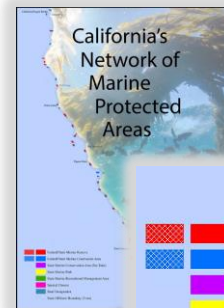
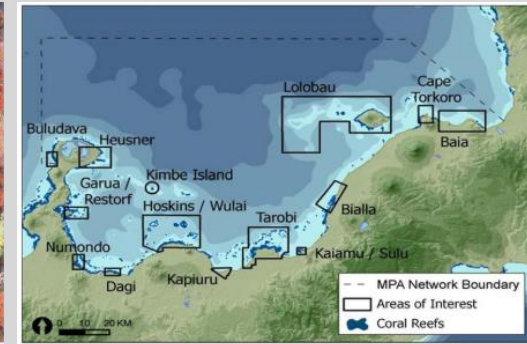
**Isolated**

Edgar et al., 2014

- **Proactive Approach to No-Take Proliferation**
- **Scale-up designation (OECMs inclusion)**
- **Anthropogenic impacts Minimization**  
(e.g. pollution, physical degradation)



Green et al., 2013



[https://cdfwmarine.wordpress.com/wp-content/uploads/2021/08/mpanetwork\\_withlegendv2.jpg](https://cdfwmarine.wordpress.com/wp-content/uploads/2021/08/mpanetwork_withlegendv2.jpg)



# The Way Forward

## MPAs Management Effectiveness along with MPA network



Giakoumi et al., 2018.



Thank you for your attention

