

Putting Blue Carbon and ESG into MPAs Management in East Asia

13th September, 2023

NEAMPAN Webinar on Accelerating Ocean-based Actions for Sustainable Development



Jungho NAM



한국해양수산개발원
KOREA MARITIME INSTITUTE

Presentation Outline

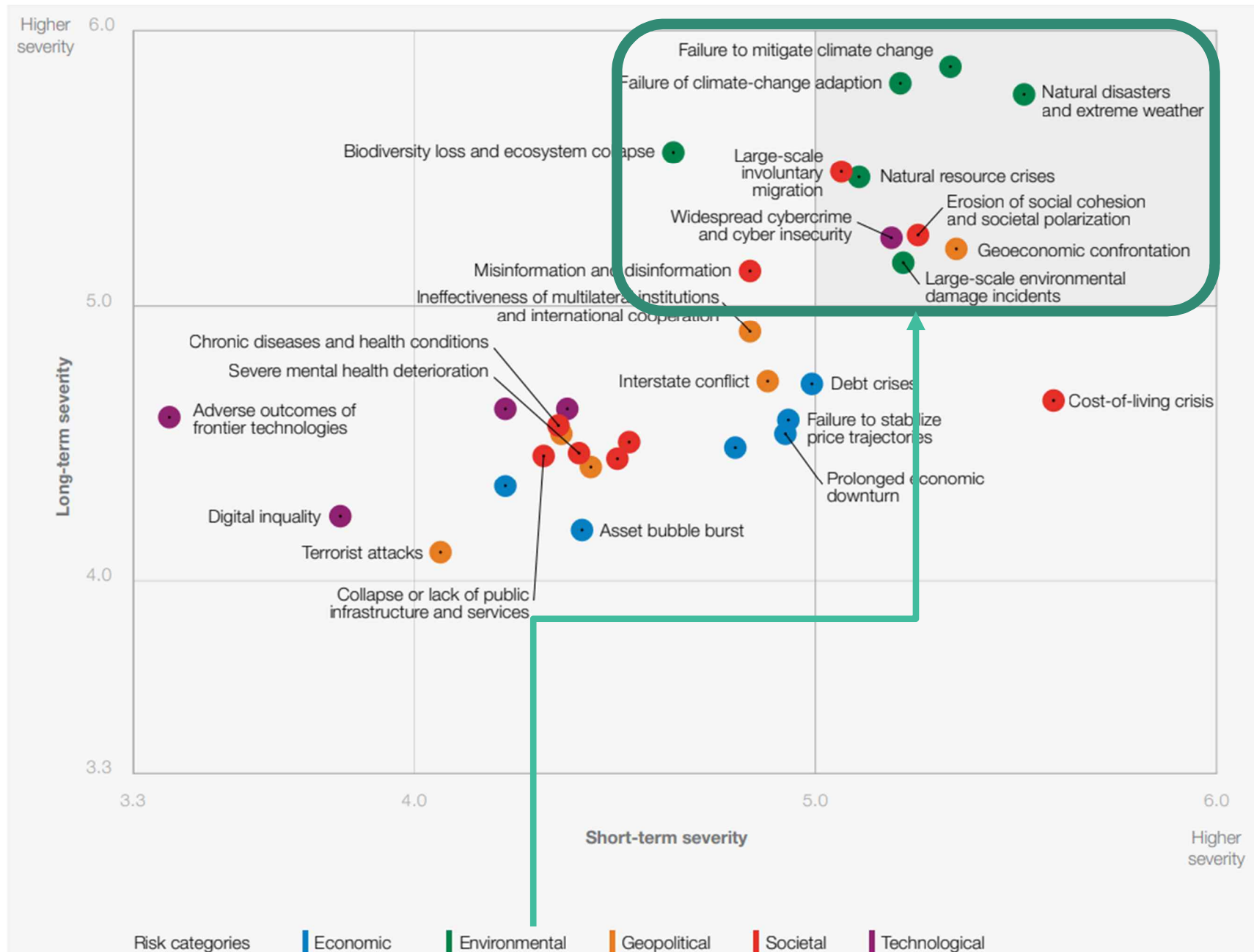
Global Risk Sketch

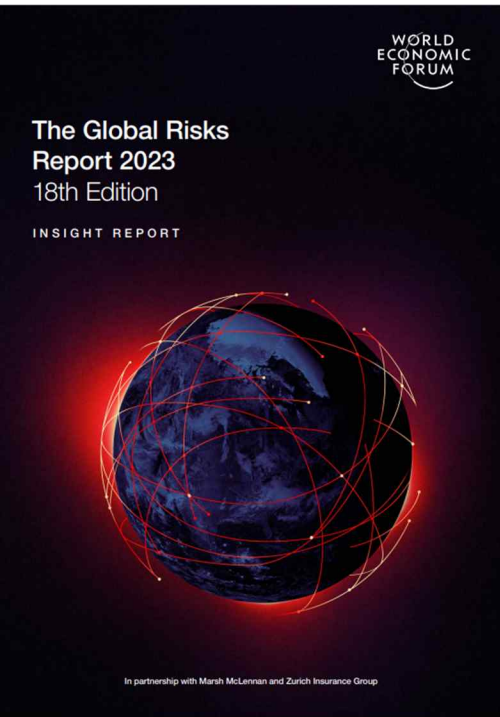
Blue Carbon and ESG as Twin Crisis Solution

Challenges for Putting Blue Carbon and ESG into MPAs

Global Risk Sketch

Climate Change and Biodiversity, Core Agenda for SD





WEF, 2023

Global risks ranked by severity over the short and long term

"Please estimate the likely impact (severity) of the following risks over a 2-year and 10-year period"

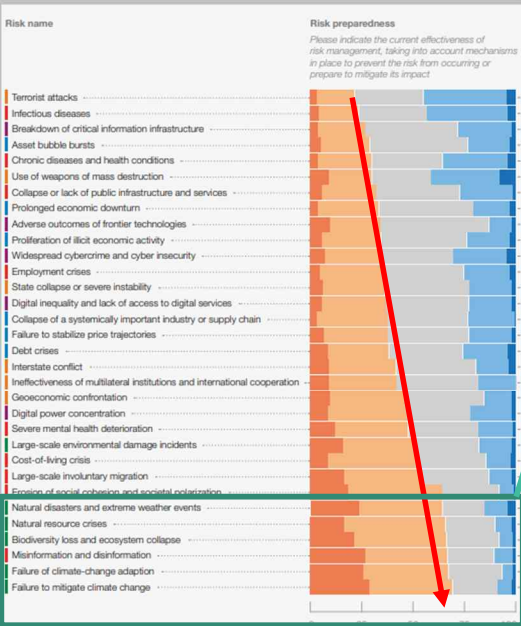
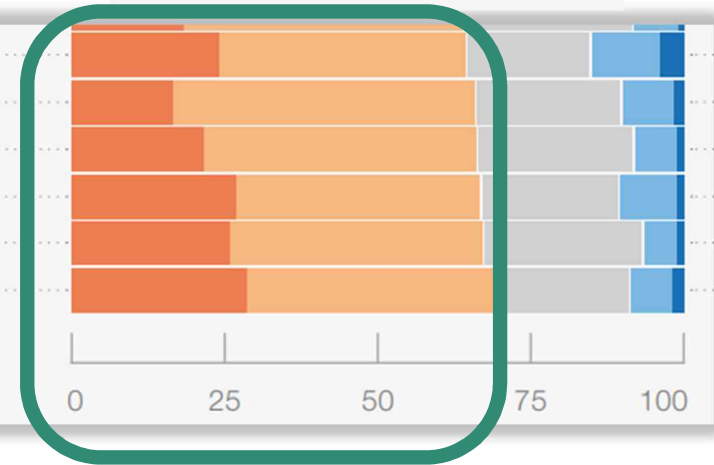
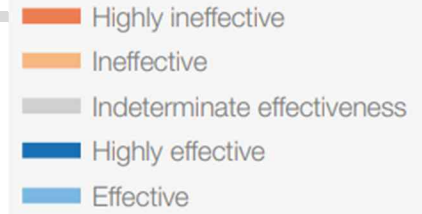
Twin Crisis



Natural ecosystems: past the point of no return

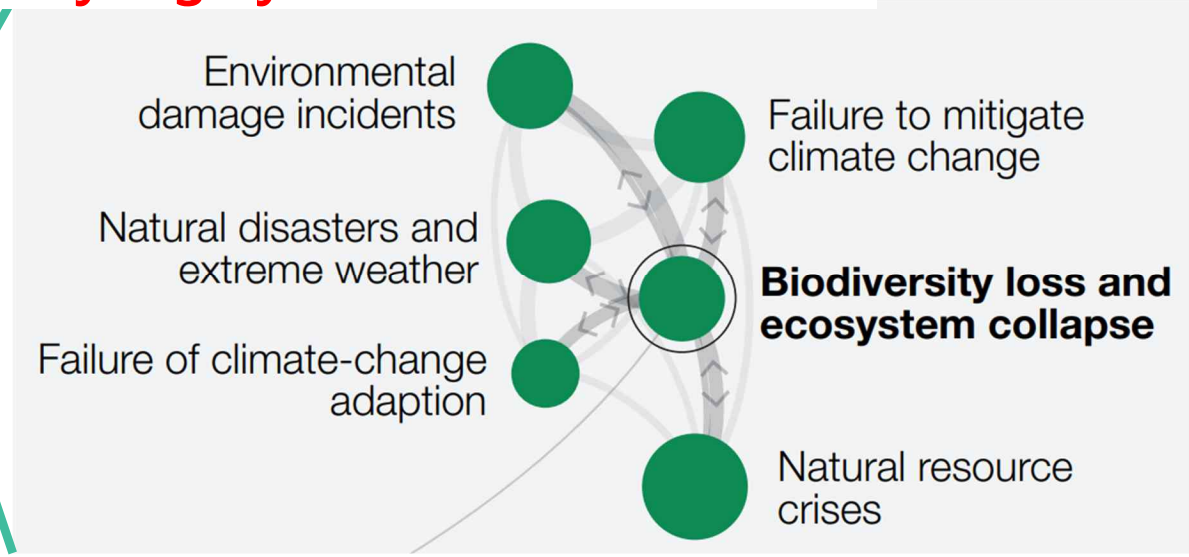
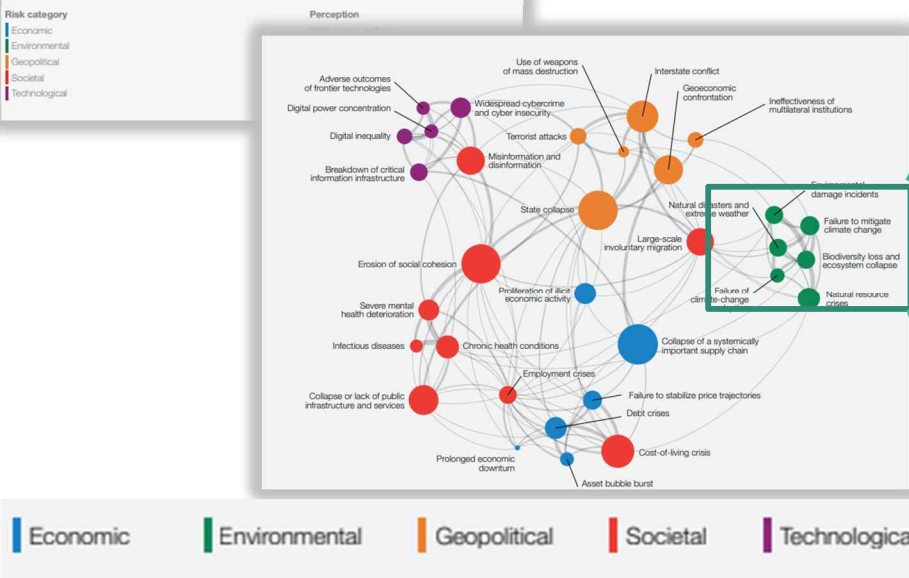
Risk Preparedness, *INEFFECTIVE*

Perception



- 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

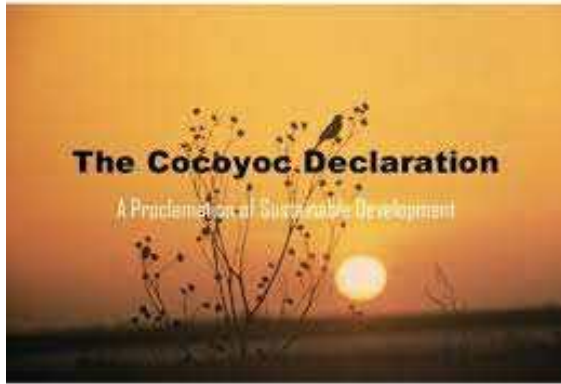
Very Highly Interlinked Twin Crisis



Blue Carbon and **ESG** as **Twin Crisis Solution**

Brief History of Mainstreaming Climate and Biodiversity Issues

1974



1987



UNFCCC, CBD

1992 Rio UNCED



2002 Rio+10 (WSSD)



2012 Rio+20



2015 SDGs/Paris

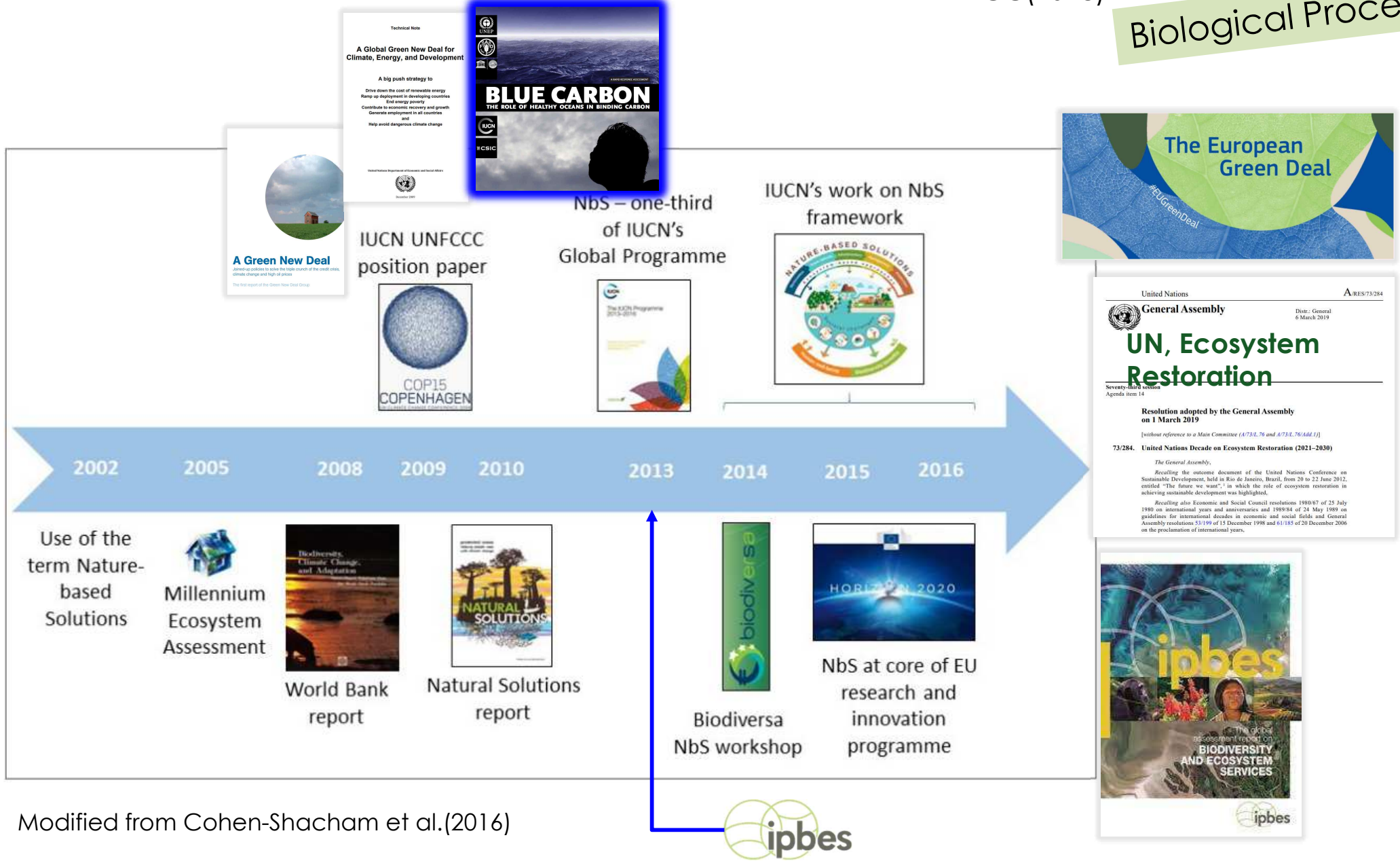


Blue Carbon, Integrated and Ocean & Nature-based Solution

Carbon is biologically sequestered in coastal sediments, commonly known as 'blue carbon'

IPCC(2018)

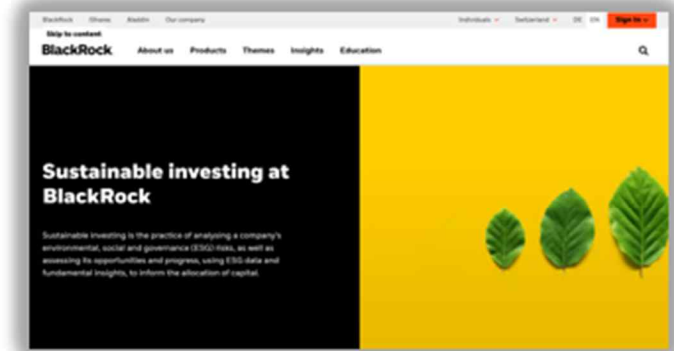
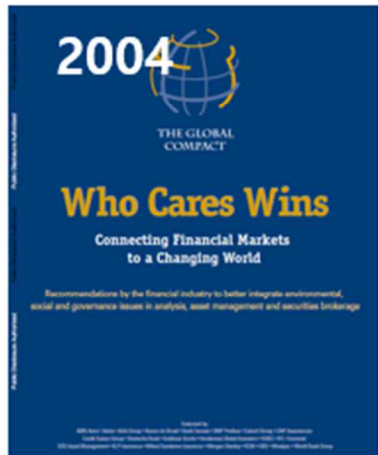
Biological Process



Modified from Cohen-Shacham et al.(2016)

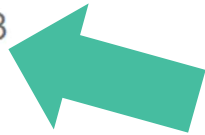


ESG, very far beyond CSR or CSV



IFRS Sustainability Disclosure Standards have been released

Publication date: 26 Jun 2023



IFRS Sustainability Disclosure Standards

IFRS S1

General Requirements for Disclosure of Sustainability-related Financial Information

2023

P



IFRS S2

Climate-related Disclosures

2023

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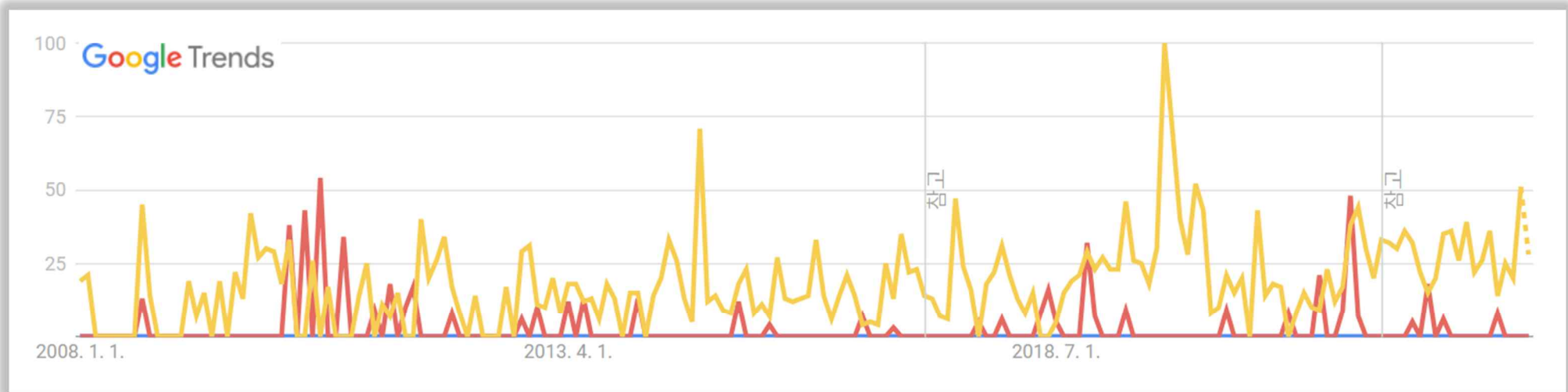
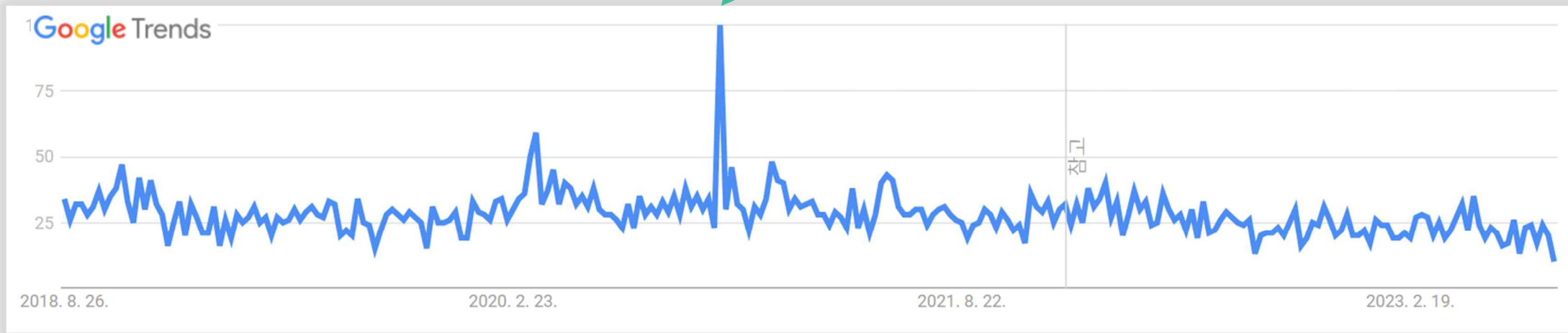


Non-financial indicators



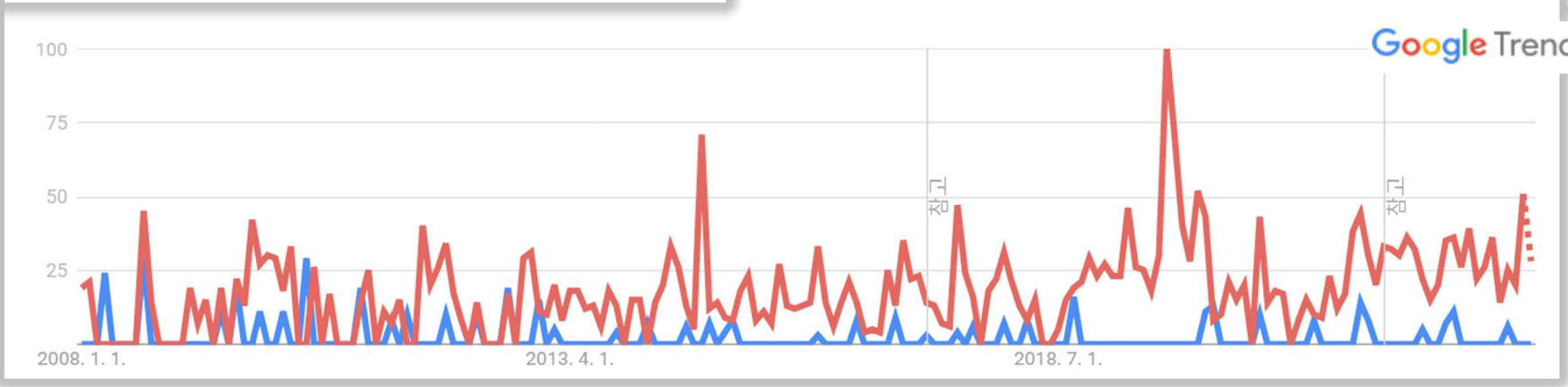
NbS

COP27

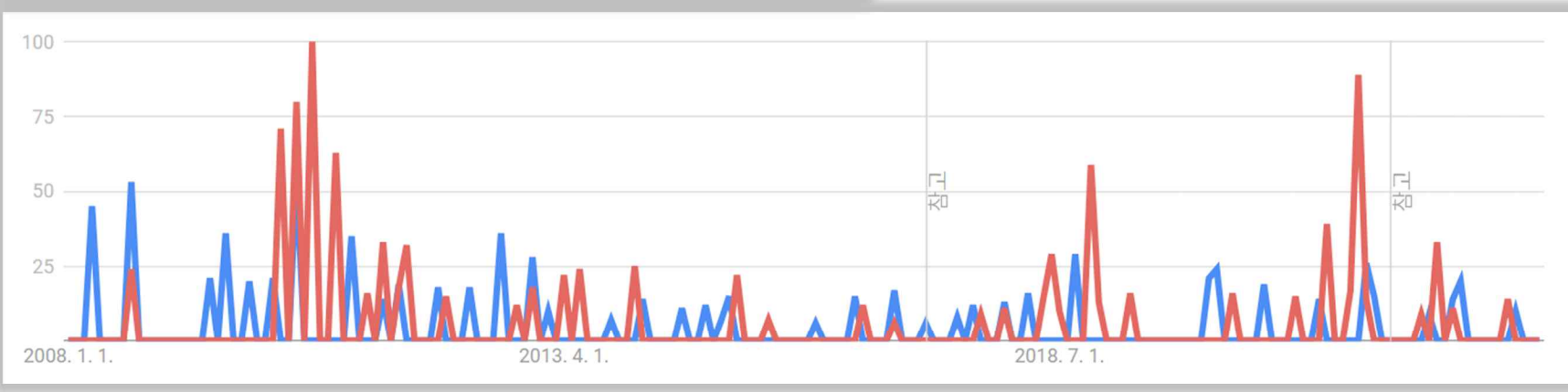


● ocean-based solution ● Marine Protected Area ● climate change

● blue carbon ● climate change



● blue carbon ● Marine protected area



● ESG ● Marine protected area



Challenges for Putting **Blue Carbon and ESG** into **MPAs**

Much less findings in East Asian Region, than global findings

CLIMATE CHANGE

Climate-smart marine protected areas can shield biota from global warming: Experts

Most current MPAs are located in coastal areas, while only 1.2 per cent of the high seas are protected

DowntoEarth, 2023 (8 Feb)

Hamilton et al, 2023

Received: 20 April 2023 | Revised: 21 June 2023 | Accepted: 21 June 2023
DOI: 10.1111/gcb.16862

RESEARCH ARTICLE

Global Change Biology WILEY

A marine protected area network does not confer community structure resilience to a marine heatwave across coastal ecosystems

Joshua G. Smith^{1,2} | Christopher M. Free^{3,4} | Cori Lopazanski^{1,3} | Julien Brun¹ | Clarissa R. Anderson⁵ | Mark H. Carr⁶ | Joachim Claudet⁷ | Jenifer E. Dugan⁴ | Jacob G. Eurich^{1,8} | Tessa B. Francis⁹ | Scott L. Hamilton¹⁰ | David Mouillot^{11,12} | Peter T. Raimondi⁶ | Richard M. Starr¹⁰ | Shelby L. Ziegler¹³ | Kerry J. Nickols¹⁴ | Jennifer E. Caselle⁴

Smith et al, 2023

ICES Journal of Marine Science, 2023, 0, 1–13
DOI: 10.1093/icesjms/ftsad120
Original Article



Variable exposure to multiple climate stressors across the California marine protected area network and policy implications

S. L. Hamilton^{1,2,*}, E. G. Kennedy^{1,3}, M. Zulian^{1,3}, T. M. Hill^{1,3}, B. Gaylord^{1,4}, E. Sanford^{1,4}, A. M. Ricart^{5,6}, M. Ward⁷, A. K. Spalding^{8,9}, and K. Kroeker¹⁰

MPAs exposed most frequently to anomalously warm conditions were less likely to experience hypoxia and low pH, although exposure to hypoxia ~. Finally, we found that the **spatial patterns of exposure to hypoxia and low pH across the MPA network remained stable across years.**

scientific reports

OPEN

Marine protected areas, marine heatwaves, and the resilience of nearshore fish communities

Shelby L. Ziegler^{1,2,3,4}, Jasmin M. Johnson³, Rachel O. Brooks¹, Erin M. Johnston⁴, Jacklyn L. Mohay¹, Benjamin I. Ruttenberg⁴, Richard M. Starr¹, Grant T. Waltz⁴, Dean E. Wendt⁴ & Scott L. Hamilton¹

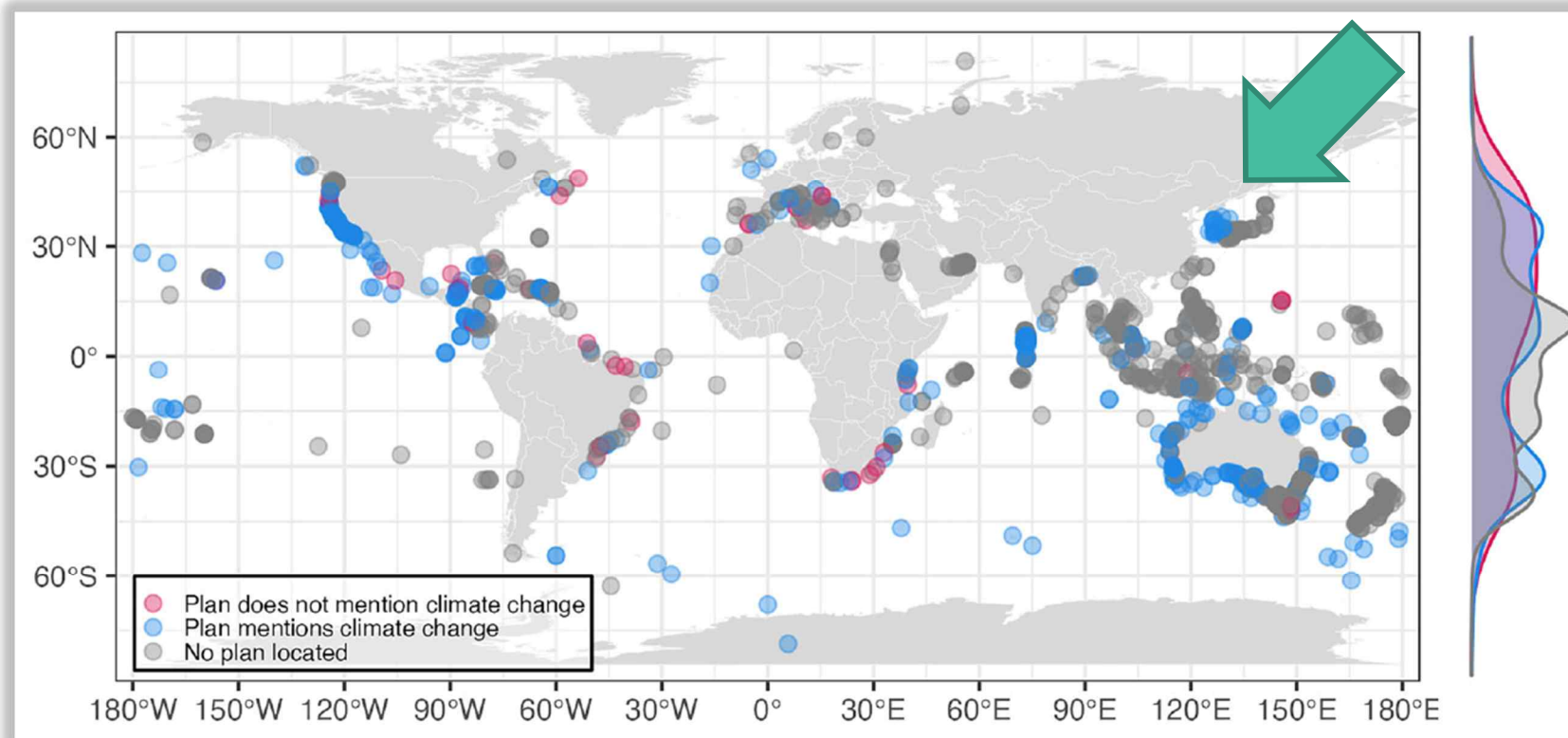
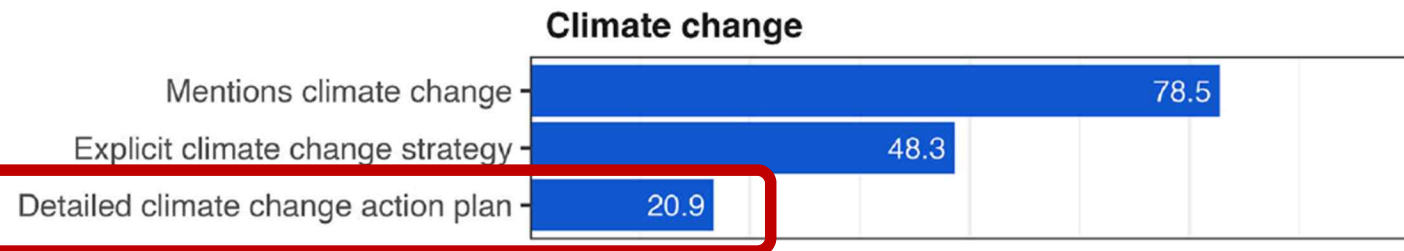
Ziegler et al, 2023

2. Climate-smart Actions at Practical Level

“Principle prevalence” irony : less or no actions at implementation level

Principles for climate resilience are prevalent in marine protected area management plans

Cori Lopazanski¹ | Bergen Foshay² | Jessica L. Couture³ | Daniel Wagner⁴ |
Lee Hannah⁵ | Emily Pidgeon⁶ | Darcy Bradley^{1,7,8}



Lopazanski, 2023

Analysis of 1609 MPAs

3. Blue Carbon Literacy Enhancement

Less recognized & mainstreamed, consequently low investment

Climate benefits from establishing marine protected areas targeted at blue carbon solutions

Emilia Jankowska^{a,ib}, Robin Pelc^{a,b}, Jimena Alvarez^{a,c,d}, Mamta Mehra^{a,ib}, and Chad J. Frischmann^{a,1}

Edited by Peter Kareiva, University of California, Los Angeles, CA; received November 30, 2021; accepted April 13, 2022

frontiers | Frontiers in Marine Science

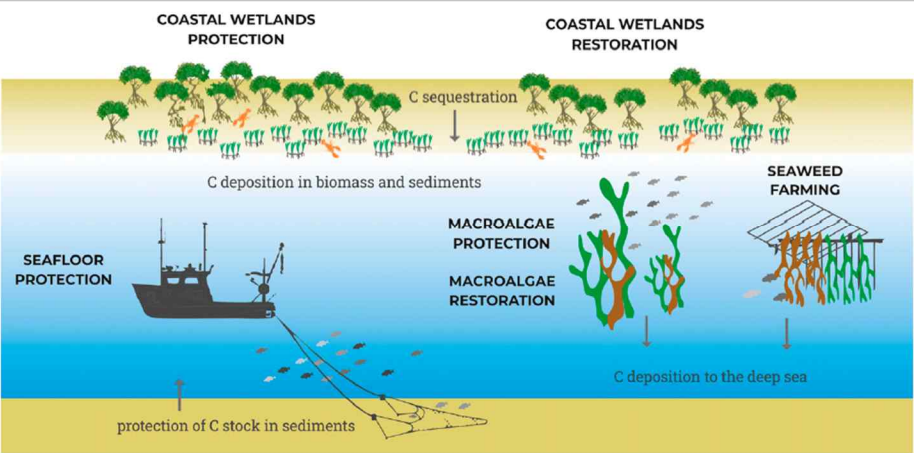
published: 29 April 2022
doi: 10.3389/fmars.2022.851448

Christianson et al., 2022

The Promise of Blue Carbon Climate Solutions: Where the Science Supports Ocean-Climate Policy

Anne B. Christianson^{1*}, Anna Cabré², Blanca Bernal³, Stacy K. Baez⁴, Shirley Leung⁵, Alicia Pérez-Porro⁶ and Elvira Poloczanska⁷

¹ Energy and Environment Department, Center for American Progress, Washington, DC, United States, ² Department of Earth and Environmental Science, University of Pennsylvania, Philadelphia, PA, United States, ³ Green-Collar, International Department, The Pew Charitable Trusts, Washington, DC, United States, ⁴ Department of Strategy and International Policy and Forestry Applications, Barcelona, Spain, ⁵ Integrative Ecophysiology, University of Washington, Seattle, WA, United States, ⁶ Department of Earth and Environmental Science, University of Pennsylvania, Philadelphia, PA, United States, ⁷ Department of Earth and Environmental Science, University of Pennsylvania, Philadelphia, PA, United States



Janowska et al., 2023

		Scale of GHG removals or emissions are significant	Long-term storage of fixed CO ₂	Anthropogenic impacts on the ecosystem are leading to C emissions	Management is practical/possible to maintain/increase C stocks and reduce GHG emissions	Included in IPCC GHG accounting guidelines ²	Climate Adaptation Value
Actionable Blue Carbon Ecosystems for Mitigation	Mangrove	YES	YES	YES	YES	YES	YES
	Tidal marsh	YES	YES	YES	YES	YES	YES
	Seagrass	YES	YES	YES	YES	YES	YES
Emerging Blue Carbon Ecosystems	Macroalgae	YES	YES	YES	YES	NO	YES
	Benthic sediments	?	YES	YES	?	NO	?
	Mud flats	?	?	YES	?	NO	YES
Other Ocean Ecosystems (Not Actionable)	Coral reef	NO	NO	NO	NO	NO	YES
	Oyster reefs	NO	?	NO	NO	NO	YES
	Phytoplankton	YES	?	?	?	?	?
	Marine fauna (fish)	NO	NO	YES	?	?	?

Source: Adapted from Lovelock & Duarte, 2019

Pidgeon et al., 2021

Marine Policy 144 (2022) 105236

Contents lists available at ScienceDirect

Marine Policy

journal homepage: www.elsevier.com/locate/marpol

Public perceptions of blue carbon in South Korea: Findings from a choice experiment

Ju-Hee Kim^a, Jung-ho Nam^b, Seung-Hoon Yoo^{a,*}

^a Department of Future Energy Convergence, College of Neweun-Gu, Seoul 01011, the Republic of Korea
^b Marine Policy Research Division, Korea Maritime Institute

Results from economic feasibility analysis of hypothetical scenarios of restoring blue carbon.

	Scenario A	Scenario B	Scenario C
Salt marsh ^a	1 km ²	2 km ²	4.5 km ²
Seagrass meadows ^b	1 km ²	3 km ²	4 km ²
Tidal flats ^c	0.2 km ²	2 km ²	4 km ²
Yearly household economic value arising from the scenario	KRW 506 (USD 0.45)	KRW 1778 (USD 1.58)	KRW 3181 (USD 2.84)
Yearly national economic value arising from the scenario ^b	10.41 (9.28)	36.58 (32.60)	65.44 (58.33)
PV of benefits ^b	86.08 (76.72)	302.46 (269.58)	541.13 (482.29)
PV of costs ^b	12.57 (11.20)	45.19 (40.28)	92.95 (82.84)
Net PV ^b	73.51 (65.52)	257.27 (229.30)	448.18 (399.45)
Benefit/cost ratio	6.85	6.69	5.82

BC ratio ≈ 6

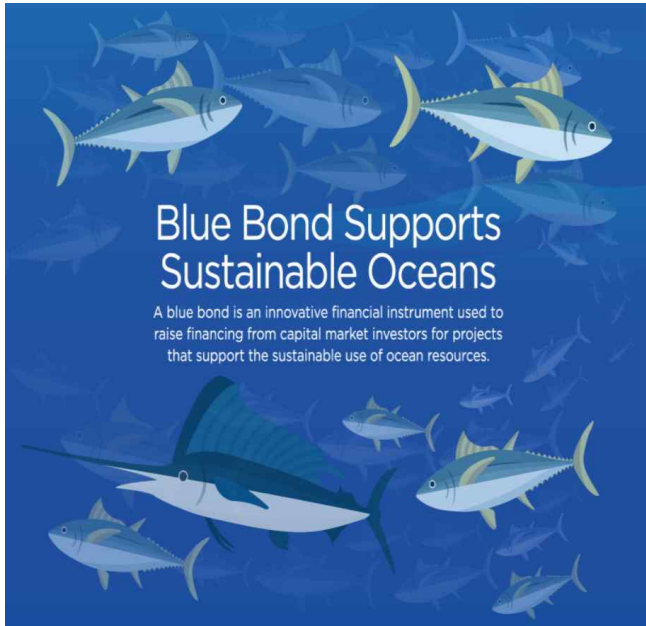
The first national scale evaluation of organic carbon stocks and sequestration rates of coastal sediments along the West Sea, South Sea, and East Sea of South Korea

Jongmin Lee^a, Beomgi Kim^a, Junsung Noh^a, Changkeun Lee^a, Inha Kwon^a, Bong-Oh Kwon^b, Jongseong Ryu^c, Jinsoo Park^d, Seongjin Hong^e, Sukhui Lee^f, Seong-Gil Kim^f, Sujin Son^g, Hoon Joo Yoon^g, Jongseo Yim^h, Jungho Nam^h, Kyungsik Choi^a, Jong Seong Khim^{a,*}

Lee, Khim, Nam et al., 2021

Lee, Nam & Yoo, 2022

Business sectors' more attention on terrestrial area



<https://www.worldbank.org/en/news/feature/2018/10/29/sovereign-blue-bond-issuance-frequently-asked-questions>

ADB investment of USD 5 bn. for Ocean

ACTION PLAN FOR HEALTHY OCEANS

INVESTING IN SUSTAINABLE MARINE ECONOMIES FOR POVERTY ALLEVIATION IN ASIA AND THE PACIFIC

ADB

ADB commits to expanding its investments and technical assistance in ocean health and the blue economy to **\$5 billion** between 2019–2024

The Action Plan for Healthy Oceans and Sustainable Blue Economies, along with a new ADB Oceans Financing initiative, will support the protection and restoration of marine ecosystems and promote inclusive livelihood opportunities. Supporting ADB's developing member countries to improve ocean health and achieve Sustainable Development Goal 14: Life Below Water ensures the livelihoods, health, resiliency, and food security of billions of people in the region.

FOCUS AREAS

- Blue Economy**
Creating inclusive livelihood and business opportunities in sustainable tourism and fisheries.
- Ecosystem Management**
Protecting and restoring coastal and marine ecosystems and key rivers.
- Pollution Control**
Reducing land-based sources of marine pollution including plastics, wastewater, and agricultural runoff.
- Sustainable Infrastructure**
Improving sustainability in port and coastal infrastructure development.

OCEANS FINANCING INITIATIVE

A new Oceans Financing Initiative will accelerate investment in projects that will improve ocean health and stimulate the blue economy. The initiative will leverage public sector funds to create investment opportunities able to attract financing from a range of sources, including the private sector. Technical assistance and funds from ADB and donors, along with innovative financing instruments such as revenue guarantees and credit-enhanced blue bonds, will be used to reduce project risks and make them "bankable".



Initiated by KMI in 2022

Green Finance

The Bahamas Plans to Sell 'Blue' Carbon Credits in 2022, PM Says

Officials have identified at least \$300 million worth of coastal assets to offer on the carbon market, according to Prime Minister Philip Davis.



Paradise Island Beach, Nassau, Bahamas, Photographer: DANIEL SLIM/AFP via Getty Images

Bloomberg (April 29, 2022)

Uncertainty in public and private sectors' investment

Verifying more reliable and implementable areas than others,

*through **PILOT PROJECTS***

International Partnership on MPAs, Biodiversity and Climate Change

Climate-smart MPAs

CASE STUDY

A case study from UK waters

CASE STUDY

Climate-smart MPAs: a case study from UK waters

In the UK evidence projects have been undertaken to improve our understanding of the role of MPAs as Nature-based Solutions in the face of a changing climate. This has involved: (i) [Understanding the role of marine biodiversity in supporting climate change adaptation and mitigation](#); (ii) [Quantifying the protection of blue carbon habitats within the UK's existing MPA network](#); (iii) [Understanding how MPA protected features may be impacted by climate change](#); and (iv) Establishing the relative importance of areas of the English seabed for blue carbon.

CASE STUDY

Greater Farallones National Marine Sanctuary Kelp Recovery Program

The kelp forests of the North American west coast support a highly diverse community of organisms, many of which are significant for local tribes and fishing communities, and act as a blue carbon ecosystem by absorbing carbon dioxide from the water during photosynthesis and incorporating it into tissues. As kelp is detached from the rock or broken apart through herbivory, it can float offshore and sink to the deep ocean where the carbon can be stored indefinitely.

International Partnership on MPAs, Biodiversity and Climate Change

Blue Carbon in Marine Protected Areas

CASE STUDY

Greater Farallones National Marine Sanctuary Kelp Recovery Program

International Partnership on MPAs, Biodiversity and Climate Change

Blue Carbon in Marine Protected Areas

CASE STUDY

Waquoit Bay National Estuarine Research Reserve - Bringing Wetlands to Market

CASE STUDY

Waquoit Bay National Estuarine Research Reserve - Bringing Wetlands to Market

Waquoit Bay National Estuarine Research Reserve (WBNERR) and partners created the "Bringing Wetlands to Market" project to demonstrate the climate mitigation benefits of salt marshes and consider how these benefits can be included in carbon markets, wetlands management and restoration, and climate policy.

Expansion of individual MPA size and Networking

Most CMPAs are small, not enough to mitigate and buffer anthropogenic impacts

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

No-take

Enforced well

Old (> 10 years)

Large (> 100 km²): small one is more vulnerable

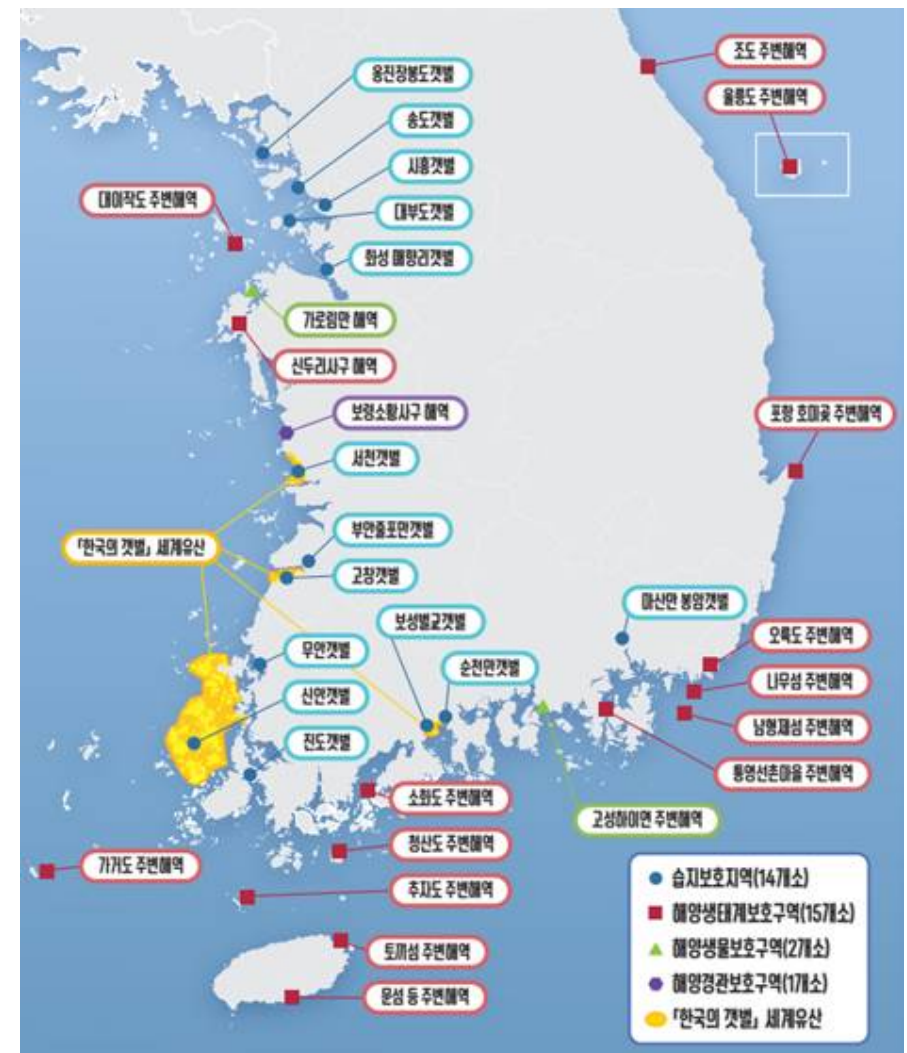
Isolated

Edgar et al., 2014, Nature

59% of MPAs, only one or two features
“not ecologically distinguishable from fished sites”

Small size of MPAs driven by political, economic and social constraints

→ less contribution to living organisms (fish, invertebrate, algae etc)(IUCN)



Brief Outline of Blue Carbon Policy Evolution

- **Wetlands Conservation Act (1999)**
- **CDM Initiative in 2001 : Wetlands restoration and plantation**
- **Marine Ecosystem Restoration and Protection incorporated into legal and institutional mechanisms (since mid-2000s)**
- **Marine Ecosystem Conservation and Management Act (2007)**
- **Implementing the Restoration Plan of Special Marine Ecosystems (since 2009)**
- **Act on the Sustainable Management and Restoration of Tidal Flats (Geatbeol) and Adjacent Areas Thereof (2019)**
- **Blue Carbon Research 1st Phase (2017~2021)**
- **Framework Act on Carbon Neutrality and Green Growth for Climate Crisis Response (2021)**
- **2nd Phase of Blue Carbon Research (2022~2026)**
- **National Strategy for Blue Carbon Promotion (May, 2023)**

국정현안관계장관회의

블루카본 추진전략

National Strategy for Blue Carbon Promotion

2023. 5. 31.

관계부처 합동

S 1. Enhancing Carbon Sequestration Habitats and Coastal Hazards Response Capacity

S 2. Promoting Cooperation with Private Sectors, Local Governments, and International Entities

S 3. Obtaining Blue Carbon certificate on Tidal Flats, and Strengthening BC promotion Infrastructure



December, 2021



November, 2022



May, 2023





Q&A