



2nd MISSION ARENA
25-26 April 2024 | Riga, Latvia

Towards the coherent planning and management of nature-based solutions for the effective protection and restoration of Baltic Sea ecosystems

THEME: Marine Protection Areas | Ocean Policies



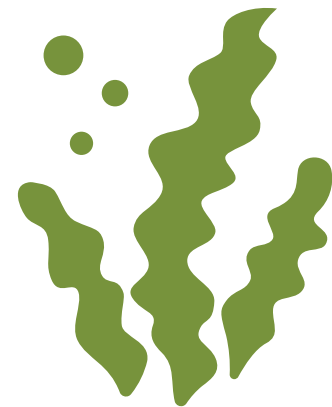
in  #Arena2



Funded by
the European Union

Spirit of the workshop

Discuss *institutional, socio-economic, and scientific challenges/solutions* to be considered when *designing spatially coherent and cross-realm strategies* for restoring and protecting Baltic Sea ecosystems.



The approach

Used the *Nature-based Solutions (NbS)* concept and novel *operational frameworks* as triggers for the discussion

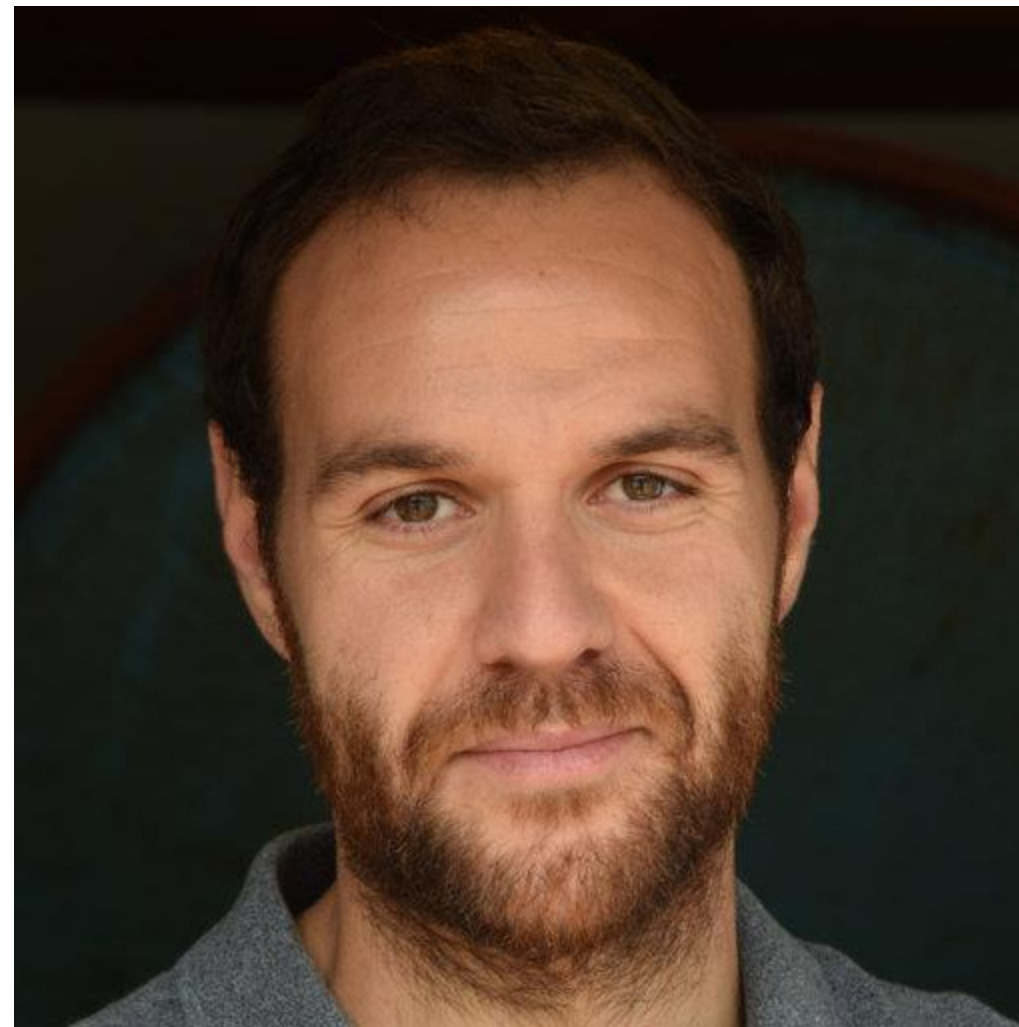
- *Inspiring talks*
- *Breakout groups*: Social, Economic, Policy, Ecological



Inspiring talks (~ 45 min)



Charles Karangwa
Global Head of Nature-based Solution
IUCN



Miguel Inácio
Researcher
Mykolas Romeris University

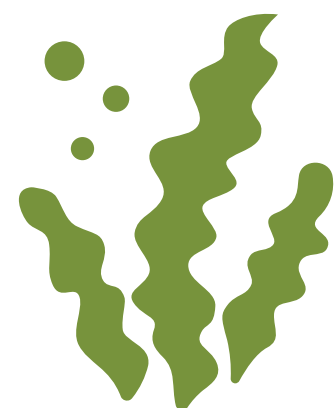


Agnė Lukoševičienė
Environment and permitting project manager
Ignitis Renewables

Breakout groups (~ 60 min)



SOCIAL



ECOLOGICAL

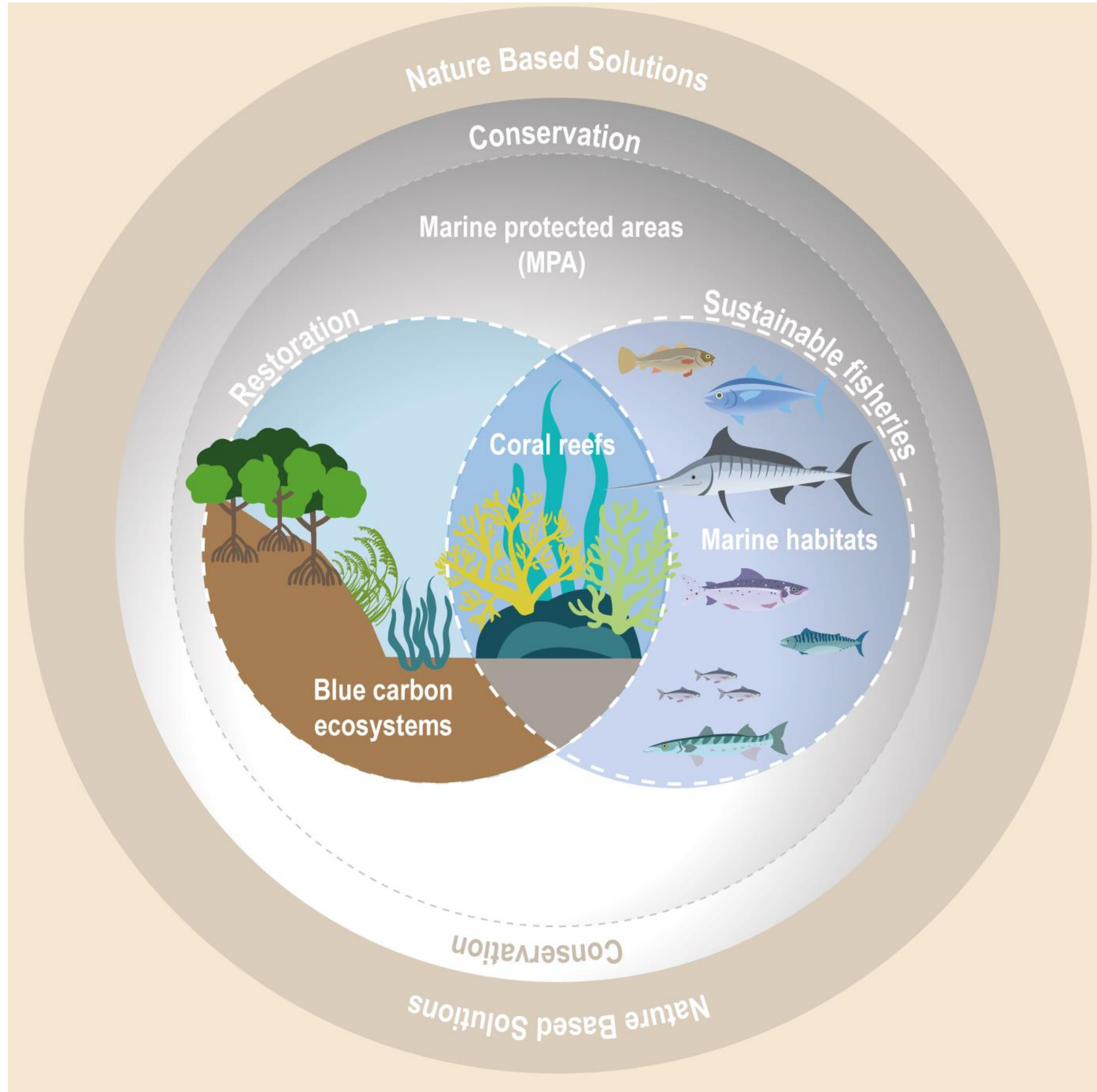


POLICY



ECONOMIC







2nd MISSION ARENA
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Nature-Based Solutions in coastal and marine environments

Miguel Inácio

Mykolas Romeris University, Lithuania

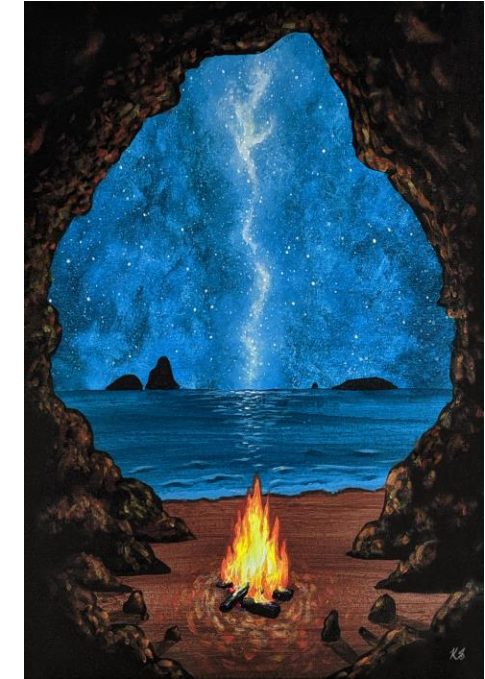
Towards the coherent planning and management of nature-based solutions for the effective protection and restoration of Baltic Sea ecosystems

in  #Arena2



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Coastal and marine areas

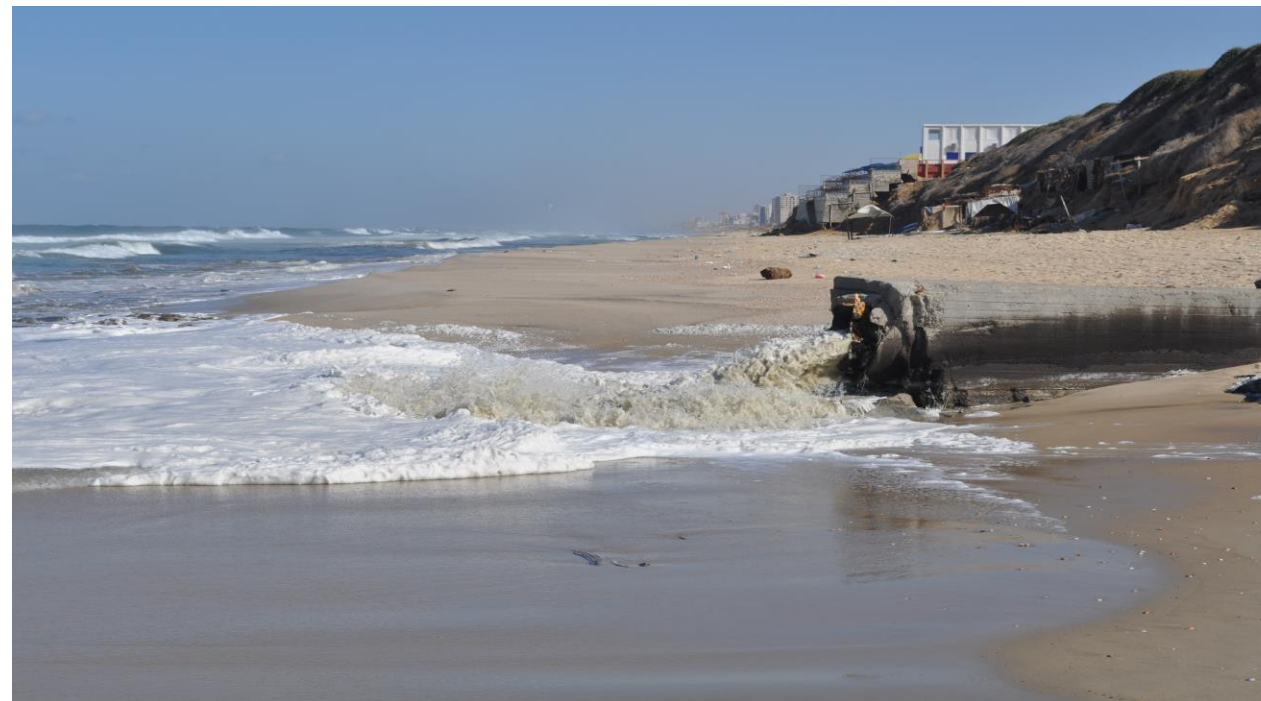


Transition



Environmental Conflicts

- **Pollution (physical and chemical)**
- **Coastal occupation (unregulated)**
- **Coastal transformation (habitats)**
- **Overfishing**
- **Invasive species**



Environmental Conflicts: causes

Population growth



Panama City, Republic of Panama, 1930-2010



Sudden storm surge slams Panama City Beach, Florida this afternoon as squall line moved through -

[@ExtremeStorms](#)

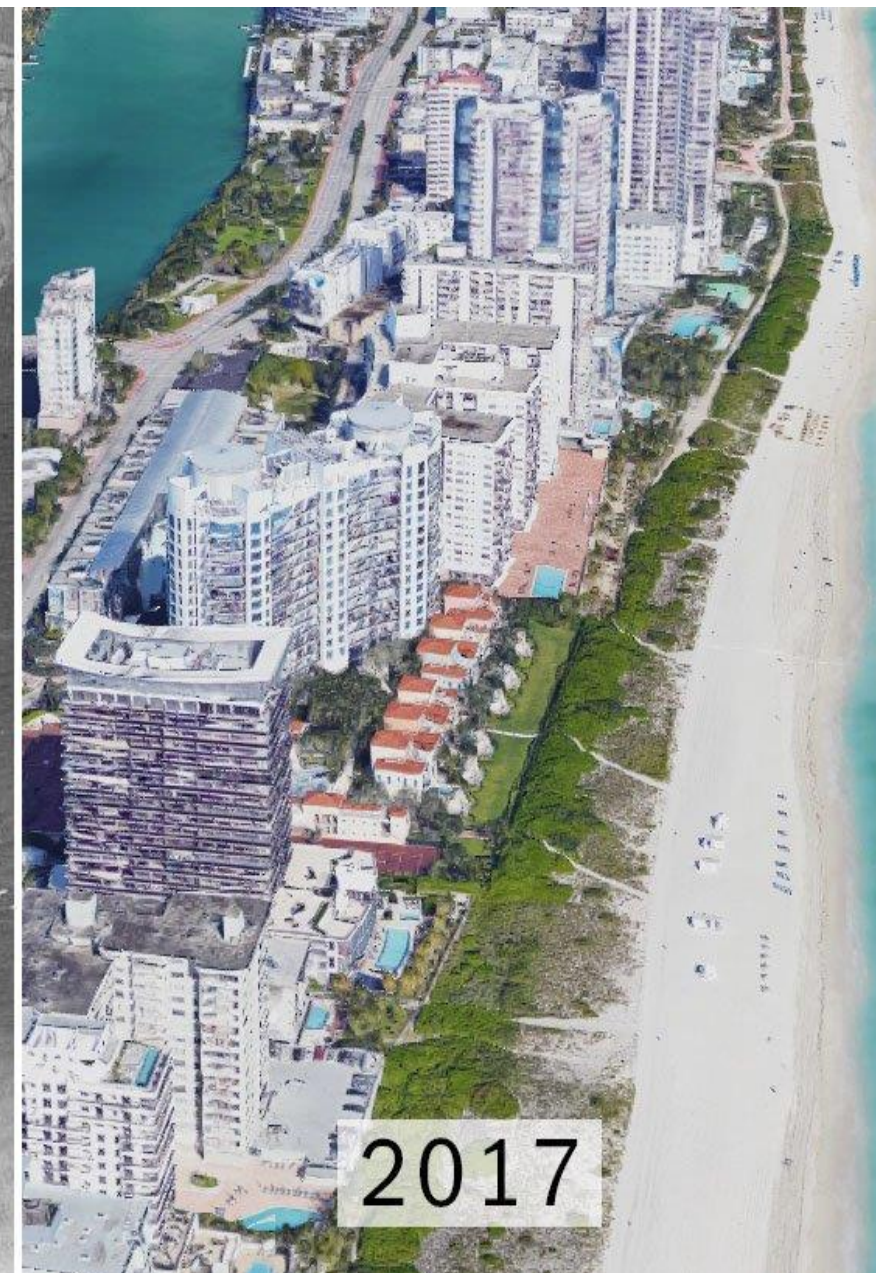
[Traduzir Tweet](#)



8:40 PM · 28 de mar de 2014 · TweetDeck

Environmental Conflicts: causes

Tourism development



Miami Beach, USA

Miami Beach's Answer to Rising Sea Levels – More Waterfront Condos

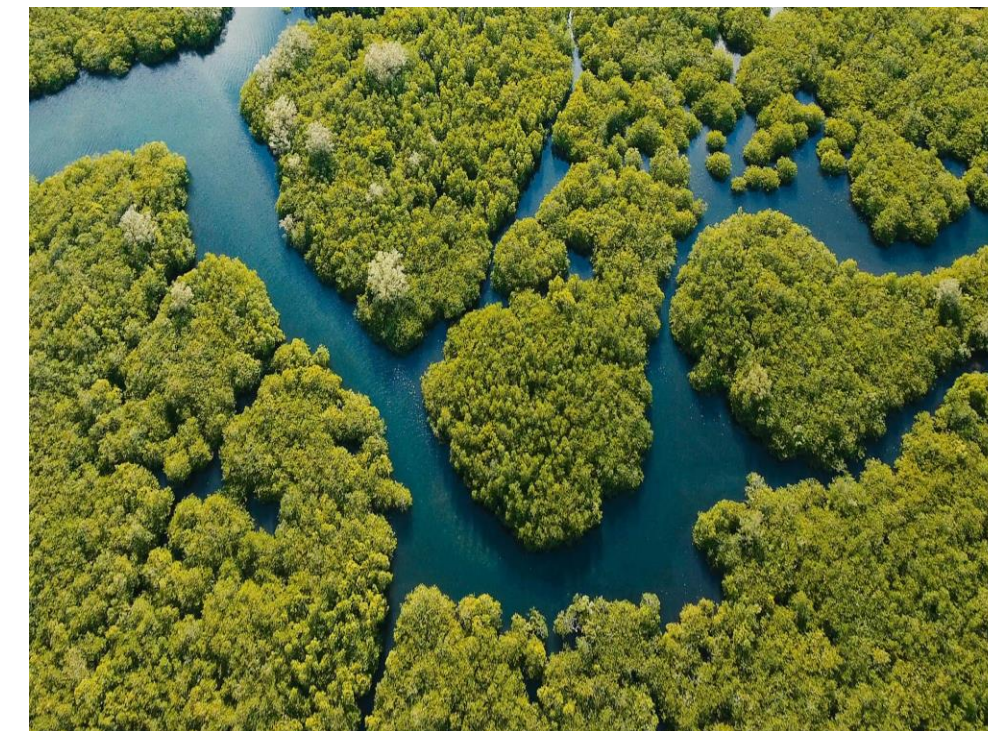
By [lenrosen4](#) December 23, 2014

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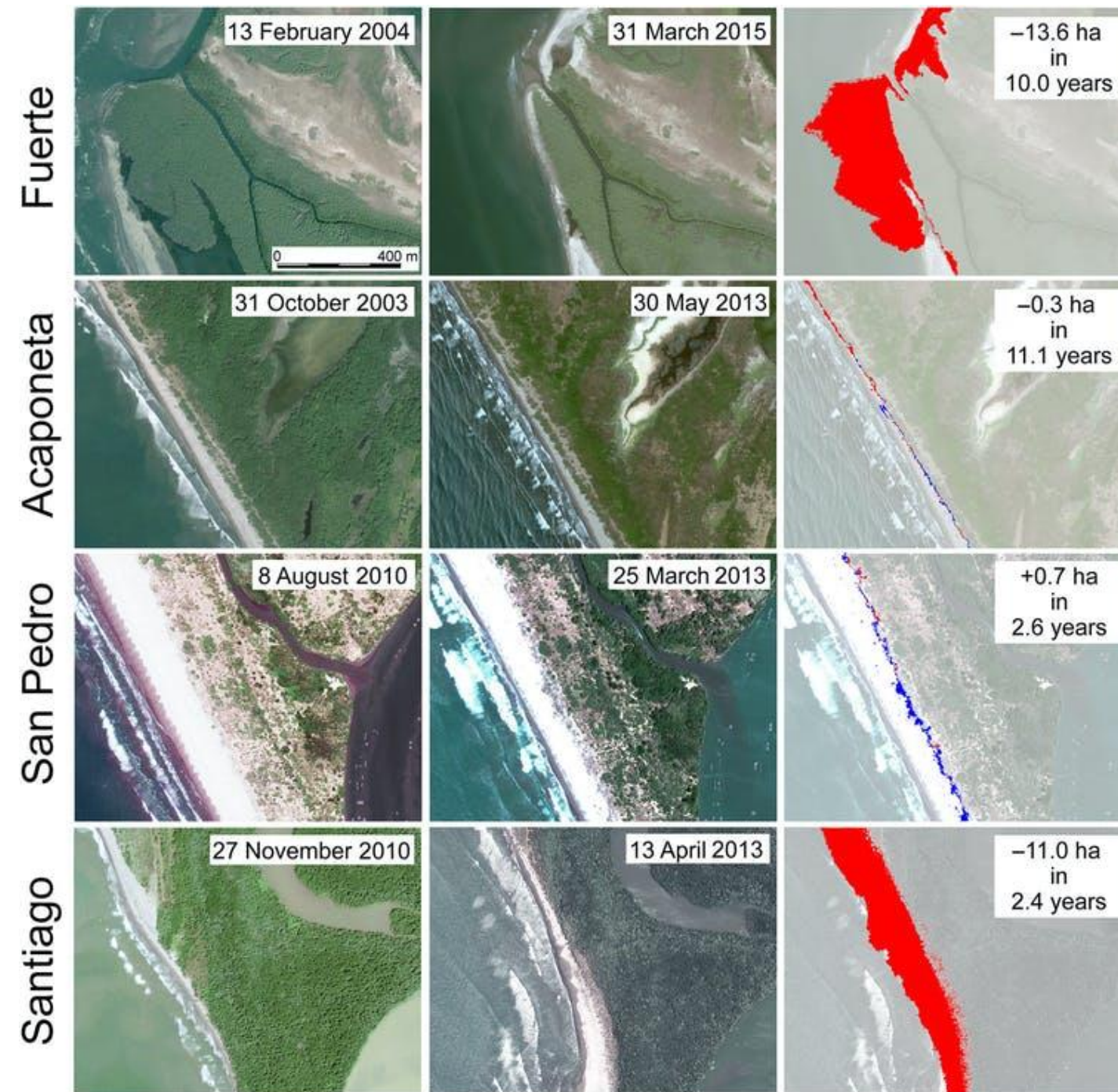
Environmental Conflicts: causes

Socio-economic activities



Environmental changes: causes

Disruption of hydrological processes



Environmental changes: causes

Natural processes (extreme events)

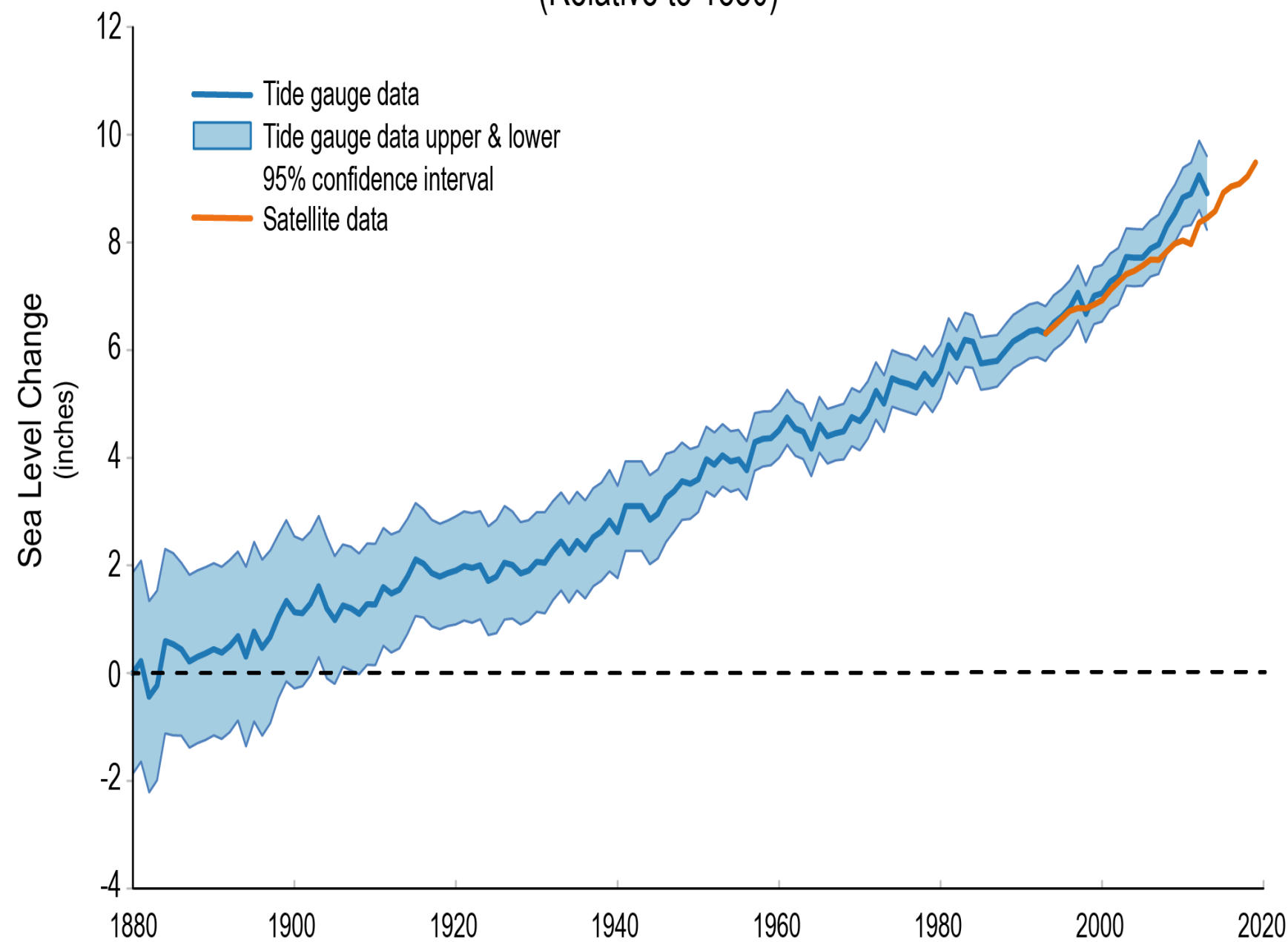


SE Beach Dunes Lost to Hurricane Matthew

Environmental changes: causes

Natural processes (eustatic – sea level rise)

Global Average Sea Level Change
(Relative to 1880)



Storm Surge and High Tides Magnify the Risks of Local Sea Level Rise

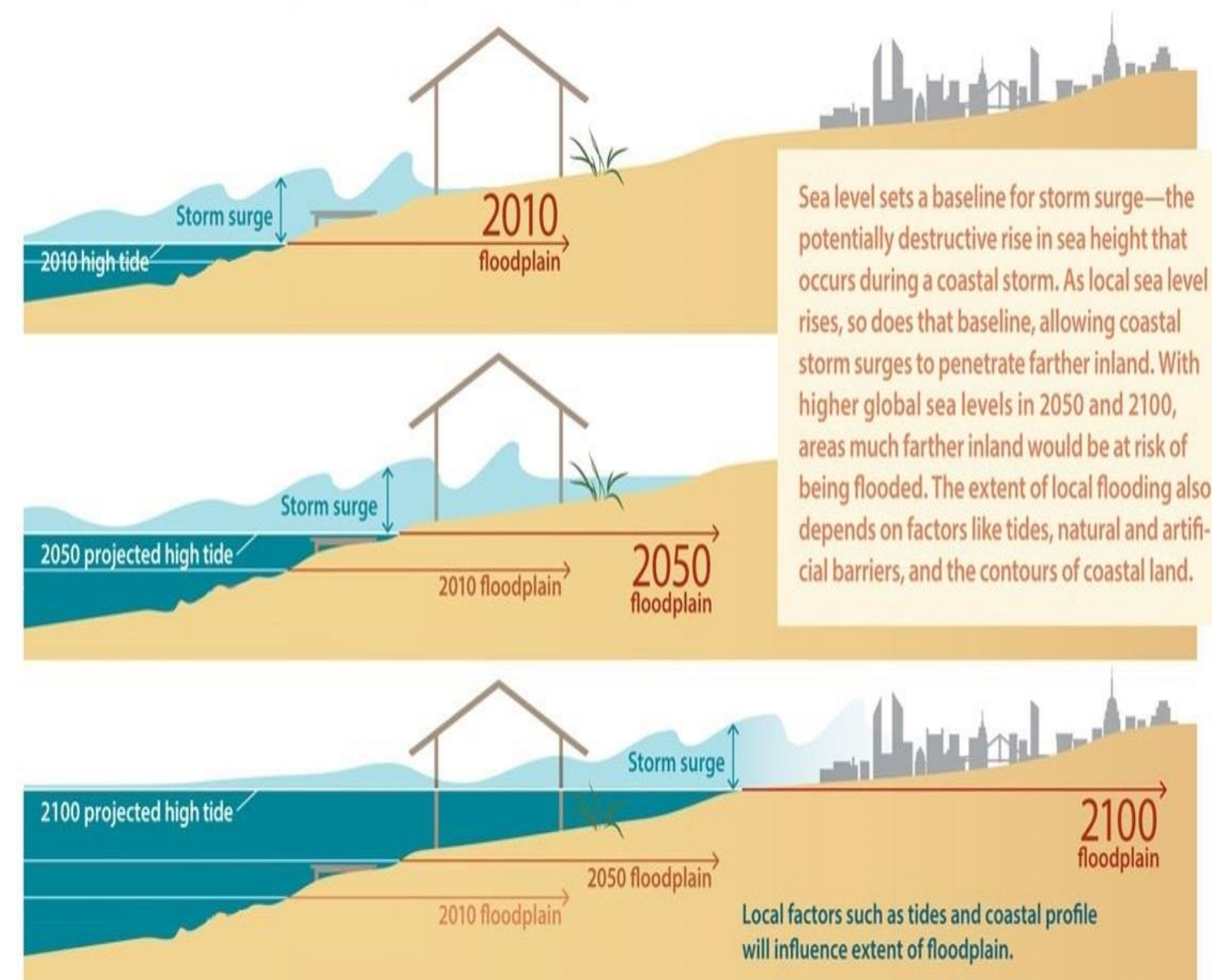


Image adapted from Union of Concerned Scientists 2013; www.ucsusa.org/sealevelrisescience

Environmental changes: consequences



Coastal flooding



Coastal erosion



Loss of landscapes



Loss of biodiversity



Material and human losses

Coastal and marine areas: need for management



mitigation of causes and effects

Coastal and Marine Management

Coastal and Marine Management

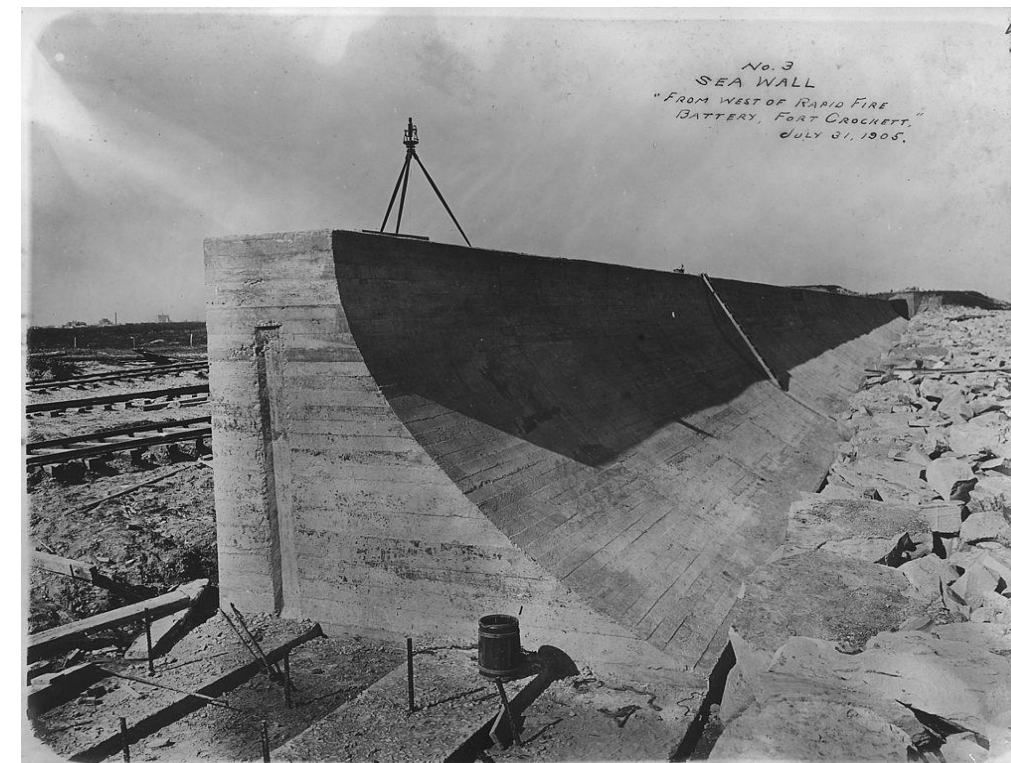
*“any management activity taking place in the coastal zone, which has a specific purpose. It includes management for **nature conservation** (including grazing management), management of **recreational activity, habitat and species restoration, coastal defence** (protection from coastal erosion and flooding) amongst a wide range of other human uses“*

Has been practiced for many years

Coastal Wiki



Sea Dikes – Netherlands, 1705



Sea wall – Galveston, 1905

avoid human, material and nutritional losses

Coastal and Marine Management

This type of coastal management continued through the 1900s

avoid human, material and nutritional losses

Sectorial approach

ecologists

engineers

**Hard/Grey
infrastructures**

Coastal and Marine Management

Hard/Grey infrastructures



Break-waters



Sea Walls



Groynes

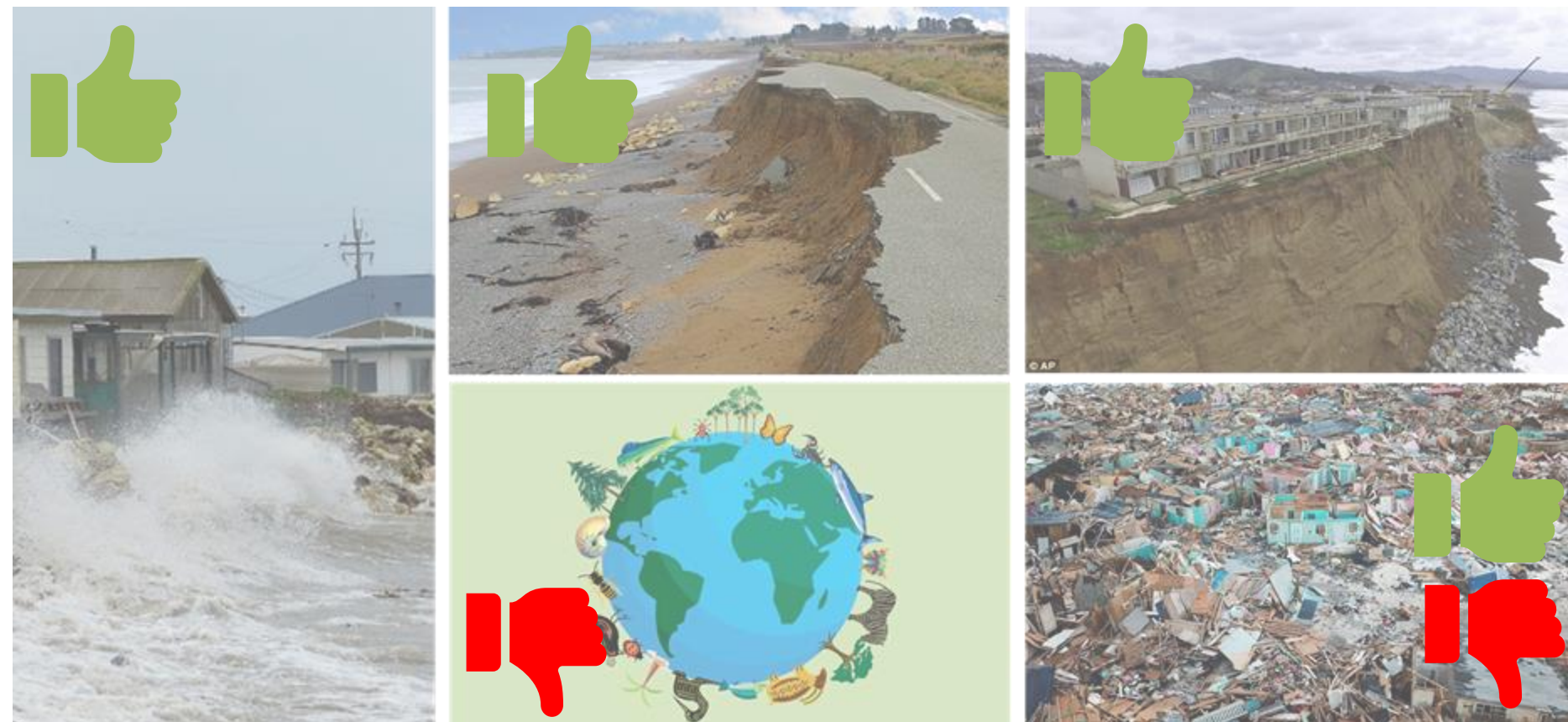
**Beach
nourishment**



Sea Dikes

Coastal and Marine Management

Hard/Grey infrastructures



concerns of ecologic degradation
and biodiversity loss

significant human and
material losses

Coastal and Marine Management

concerns of ecologic degradation
and biodiversity loss

significant human and
material losses



Sustainability

Ecosystem-Based Management

*“an **integrated approach to resource management that considers the entire ecosystem, including humans. It requires managing ecosystems as a whole instead of separately managing their individual components or uses**”*

Coastal and Marine Management

“traditional” coastal management

sectorial
approach

not considering
sustainability

no ecosystem
perspective

“disregarding”
biodiversity

immediate
response

(Nature) Ecosystem-Based Management

“...is a resource management system following an integrative, holistic approach and an interactive planning process in addressing the complex management issues in the coastal area”

**Protecting people
and assets**

**Enhancing sustainability
and ecosystem services**

**Economic
development**

**Awareness
raising**

Coastal and Marine Management

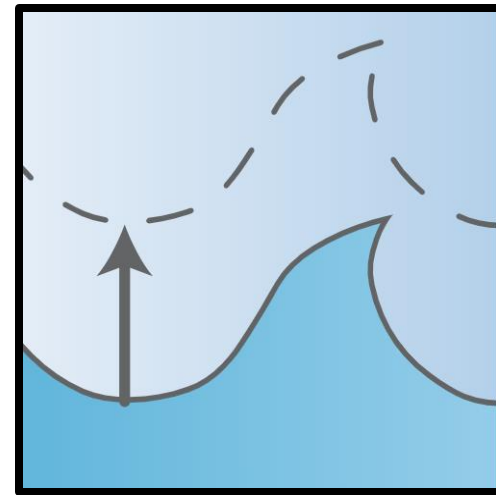


Climate Change

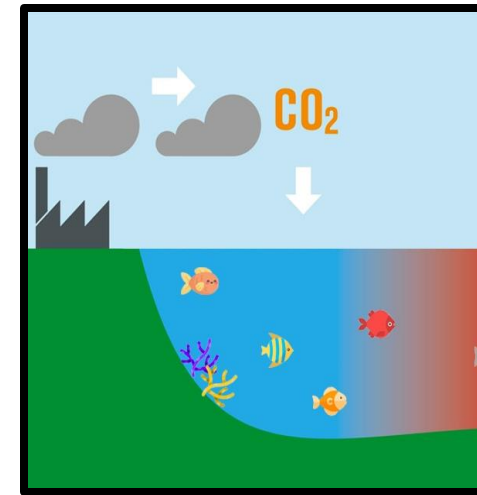
- **Loss of biodiversity**
- **Impacts in socio-economic systems**



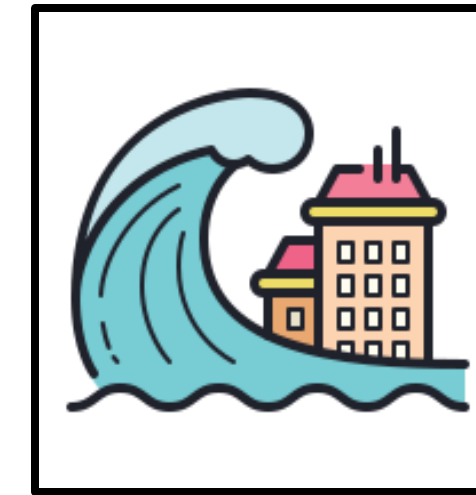
Coastal and Marine Management



Sea-level
rise



Ocean
acidification



Extreme
events



Coastal and Marine Management



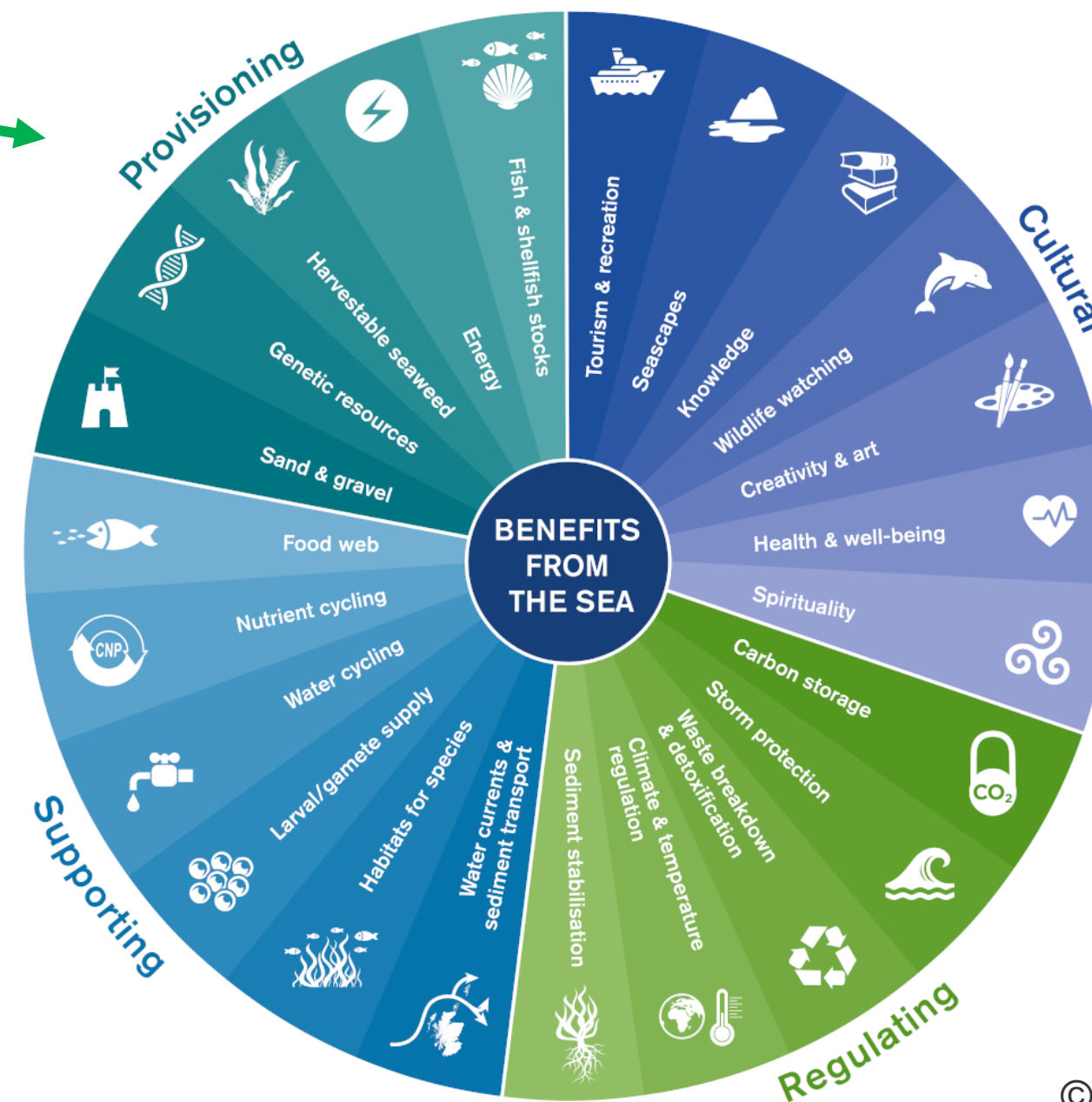
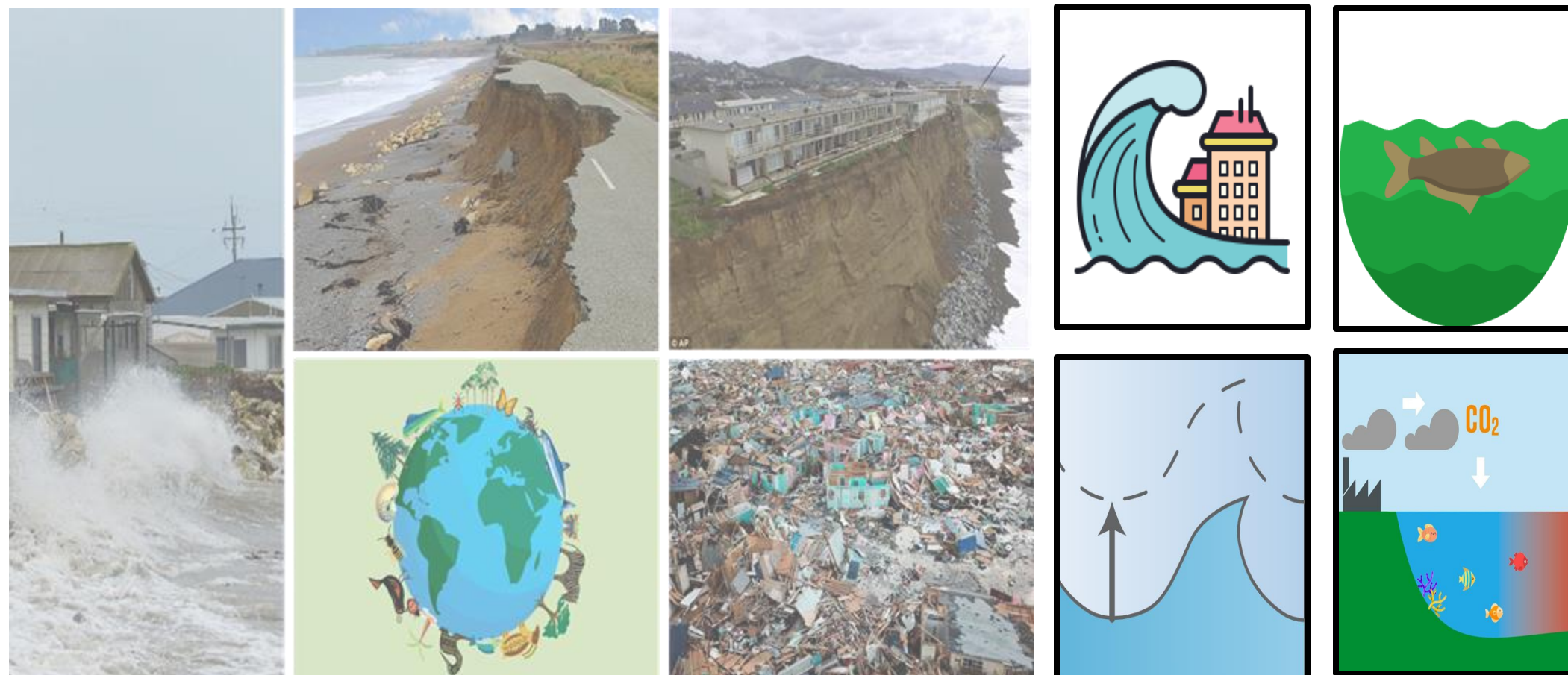
Mitigate the causes of coastal and marine ecological degradation



Looking at Nature and natural processes

Nature-Based Solutions

involve working with nature to address societal challenges, providing benefits for both human well-being and biodiversity (naturebasedsolutioninitiative.org)



Nature-Based Solutions

WFD

*“An economic analysis of v
be necessary for this purpos*

MSFD

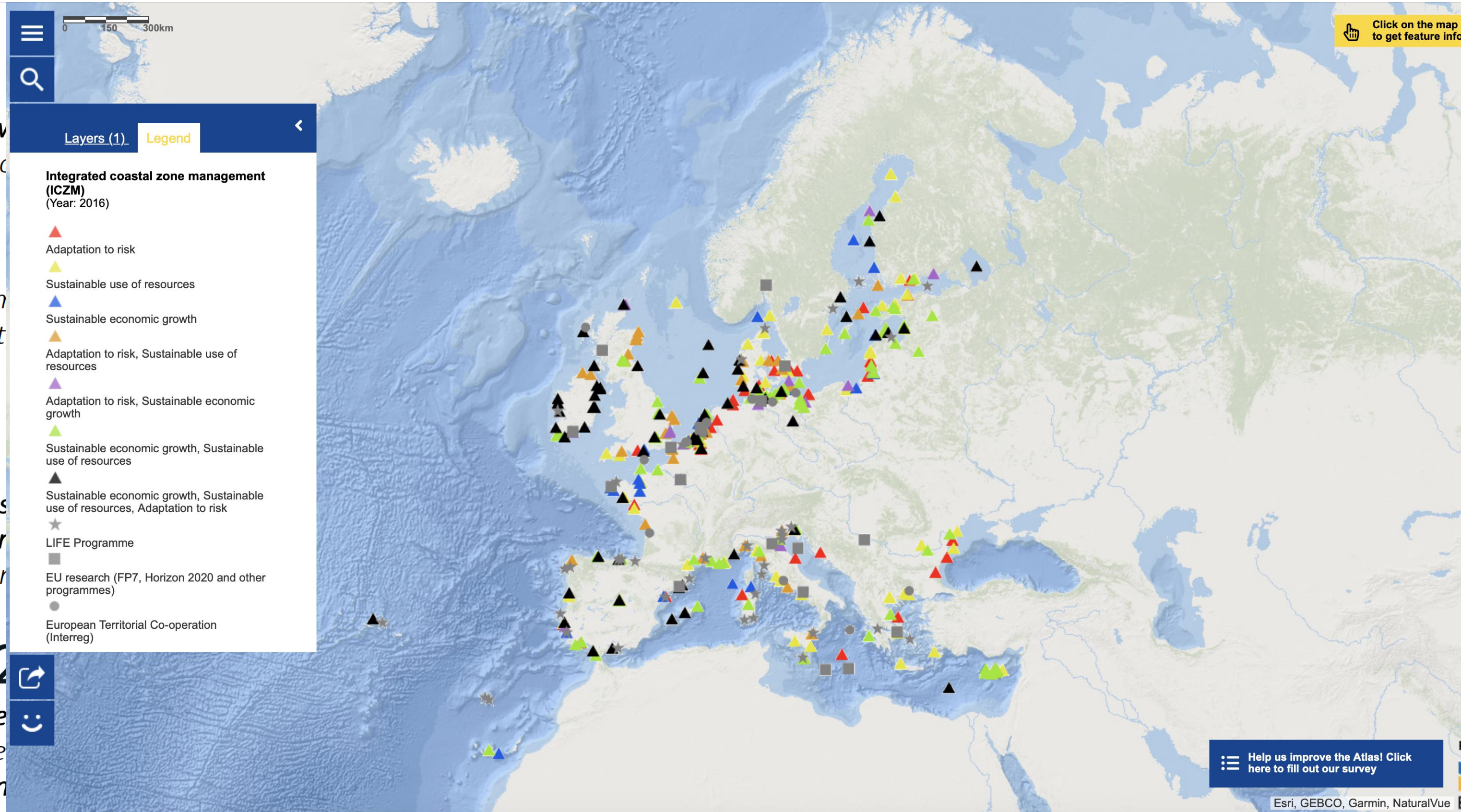
*“By applying an ecosystem
goods and services, priorit*

MSP

*“leading to deterioration
had to these various press
multiple services, if integr
tourism, climate change r*

Biodiversity 2

*“plan of actions to restore
ambitious restoration age
in turn ensuring the contin*



Nature-Based Solutions



Guidance for using the IUCN Global Standard for Nature-based Solutions

A user-friendly framework for the verification, design and scaling up of Nature-based Solutions

First edition



INTERNATIONAL UNION FOR CONSERVATION OF NATURE

The cover of the report 'Evaluating the Impact of Nature-based Solutions: A Summary for Policy Makers' features the European Commission logo at the top. The title is prominently displayed in the center. Below the title, it is identified as an 'Independent Expert Report'. The cover is decorated with a grid of 15 circular icons, each representing a different benefit or challenge addressed by NBS, such as 'Green space management', 'Climate resilience', 'Biodiversity enhancement', and 'Human well-being'.

The cover of the report 'Nature-based Solutions: EU-funded NBS Research Projects Tackle the Climate and Biodiversity Crises' features the European Commission logo at the top. The title is prominently displayed in the center. Below the title, it is identified as 'EU-funded NBS Research Projects Tackle the Climate and Biodiversity Crises'. The cover is decorated with a grid of 10 circular icons, each representing a different benefit or challenge addressed by NBS, such as 'Water management', 'Natural and Climate Hazards', and 'Green space management'.

Nature-based solutions (NBS) are inspired and supported by nature, they are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience, such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions. NBS must benefit biodiversity and support the delivery of a range of ecosystem services.

Nature-Based Solutions



Nature-based Solutions Initiative
University of Oxford

www.naturebasedsolutionsinitiative.org



www.nature-basedsolutions.com



nrcsolutions.org

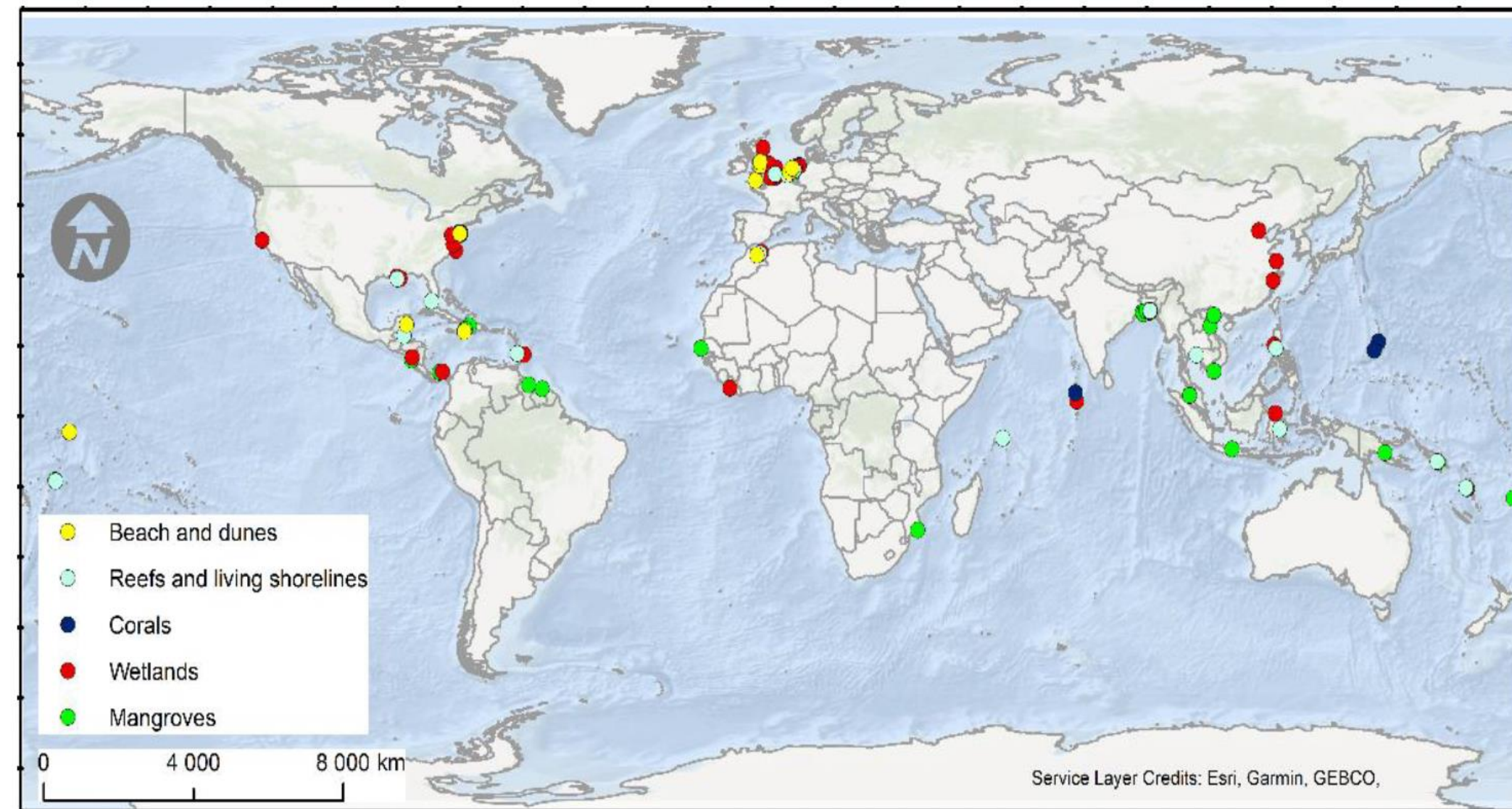


oppla.eu



... and many other institutions and efforts

Worldwide!



Location of NBS implementation efforts worldwide. Adapted from Inácio et al. 2020

Nature-Based Solutions: typology

Type 1

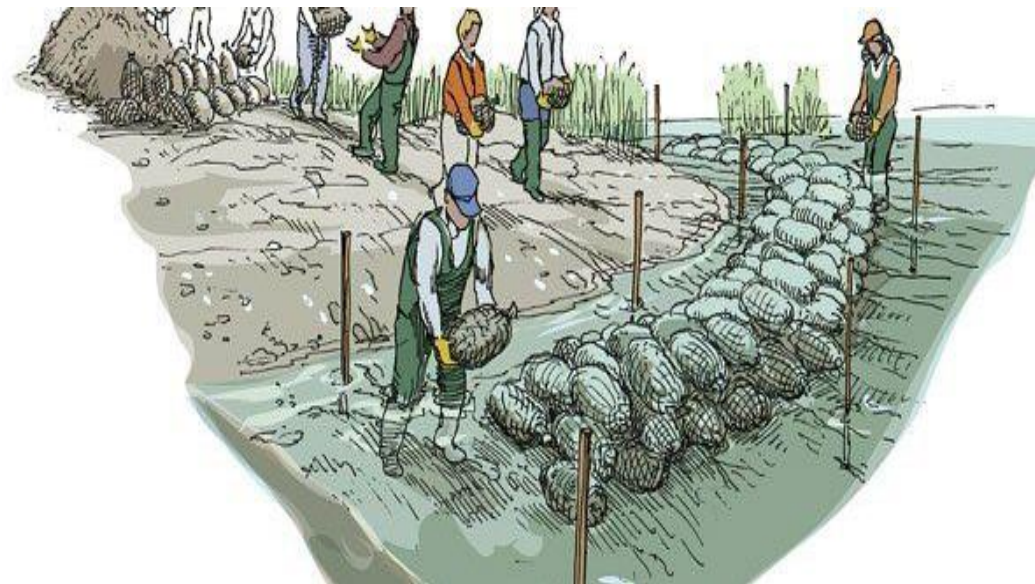
Low human intervention



e.g. protected areas

Type 2

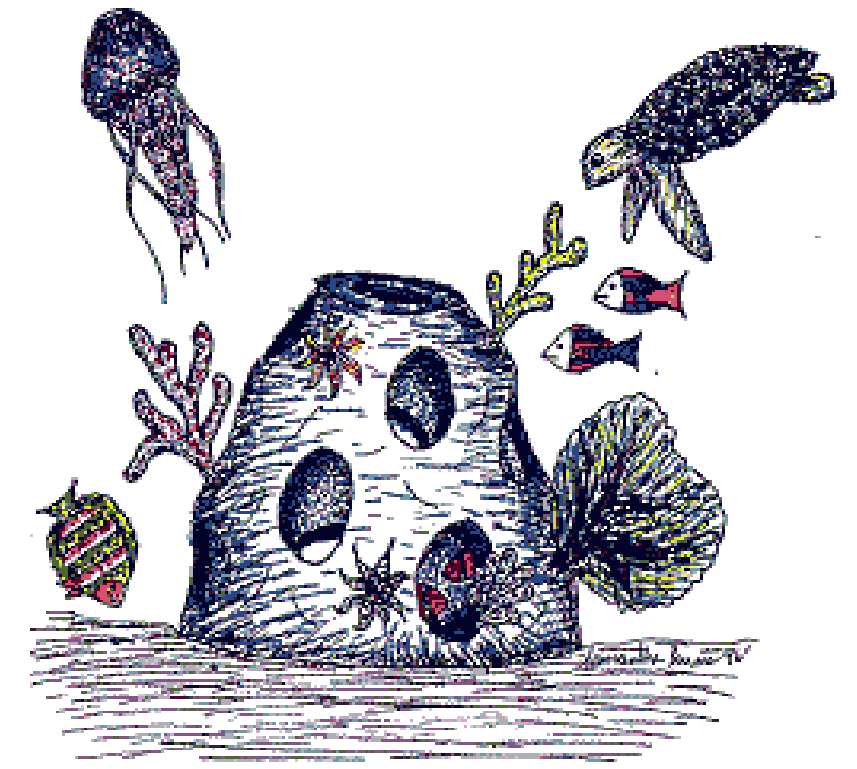
Medium human intervention



e.g. oyster reef

Type 3

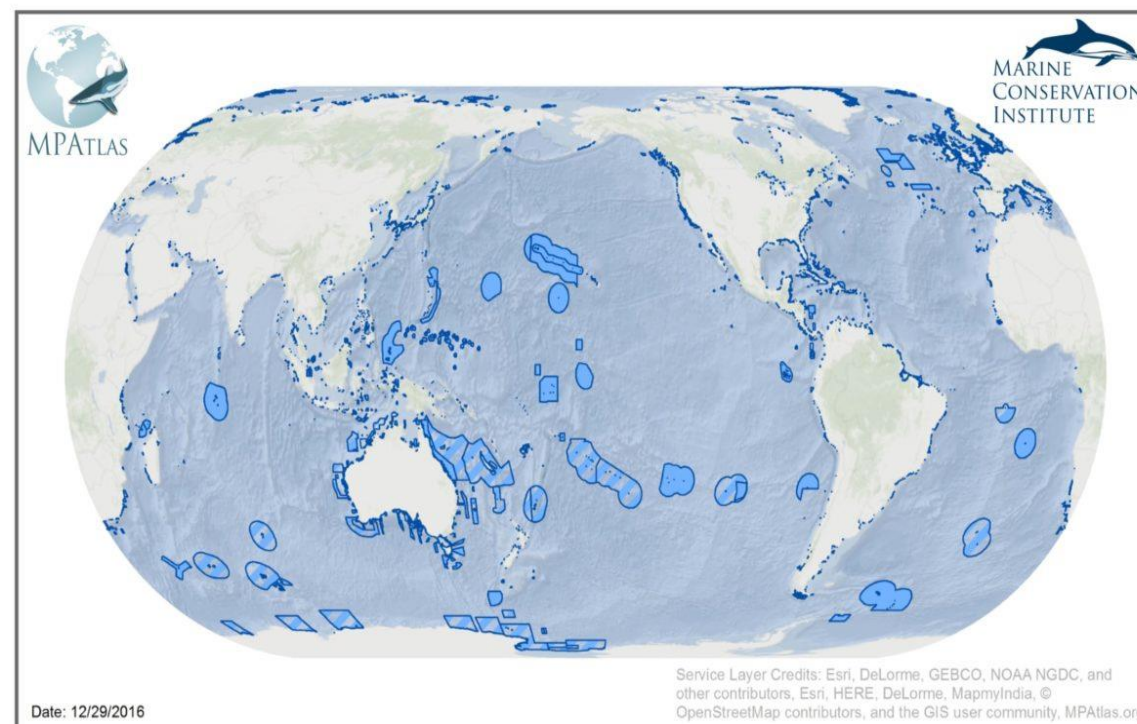
Hybrid



e.g. artificial reef

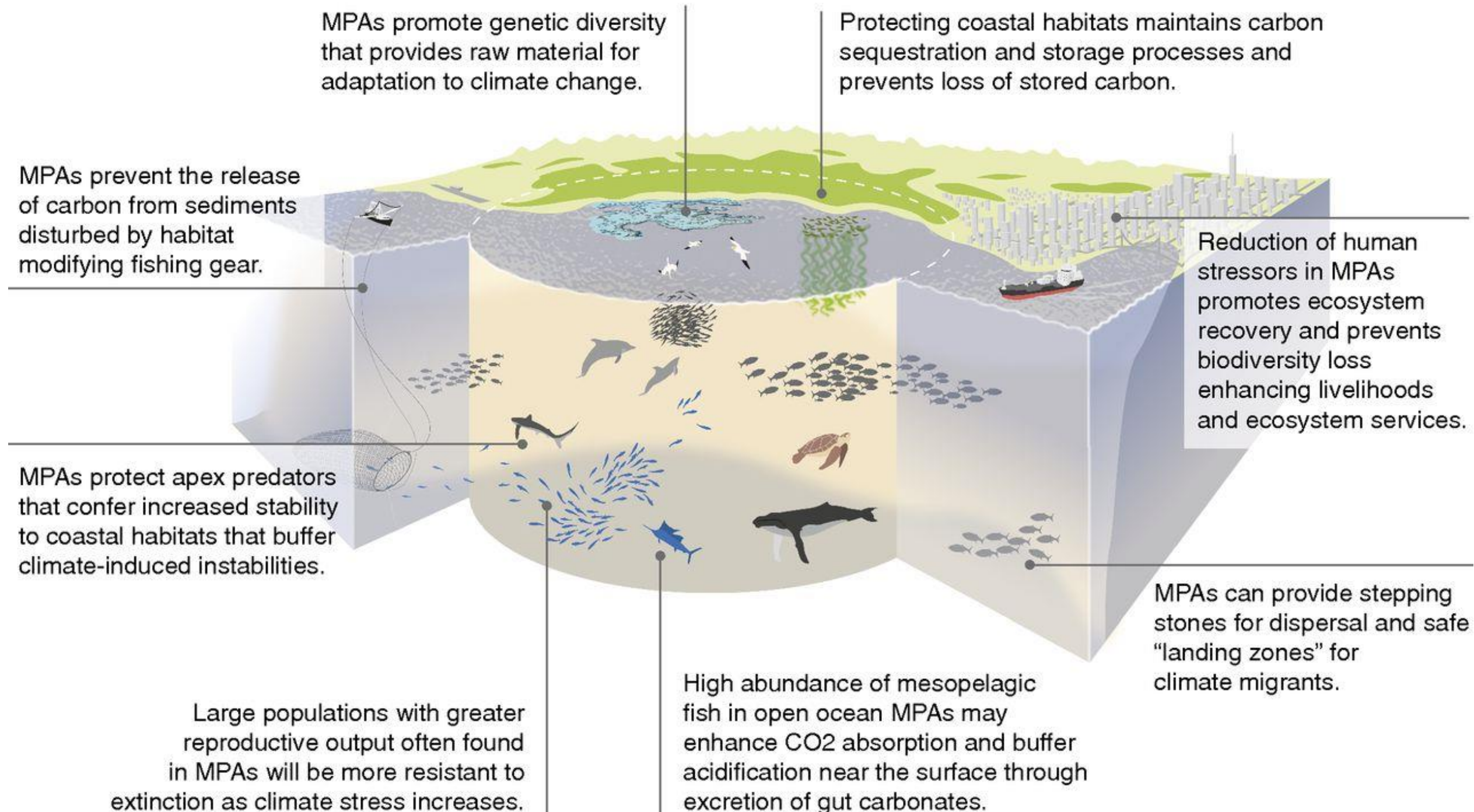
Nature-Based Solutions: Type 1

preserve coastal ecosystems and their natural capacity to provide ES and mitigate societal challenges, without active physical anthropogenic interventions



Nature-Based Solutions: Type 1

Marine Protected Areas | Help the oceans to mitigate and adapt to climate change by promoting intact and complex ecosystems with high diversity and abundance of species.



Nature-Based Solutions: Type 2

extensive and intensive physical approaches to increase the protection capacity of coastal ecosystems or to complement existing hard engineered structures (Nesshöver C, Assmuth T, Irvine KN, et al. (2017))

restoration and replantation measures



“living shorelines” measures



Nature-Based Solutions: Type 3

combine a type 2 NBS with hard grey infrastructures for maximum coastal protection, allowing the creation of innovative designs (Sutton-Grier AE, Wowk K, Bamford H (2015))



managed coastal re-alignments



artificial habitats

Nature-Based Solutions: success

Examples of success stories



Sand Motor - Netherlands



Attenuation of wave energy
Shoreline stabilization
Sediment retention and accretion



Artificial reef - Dominican Republic

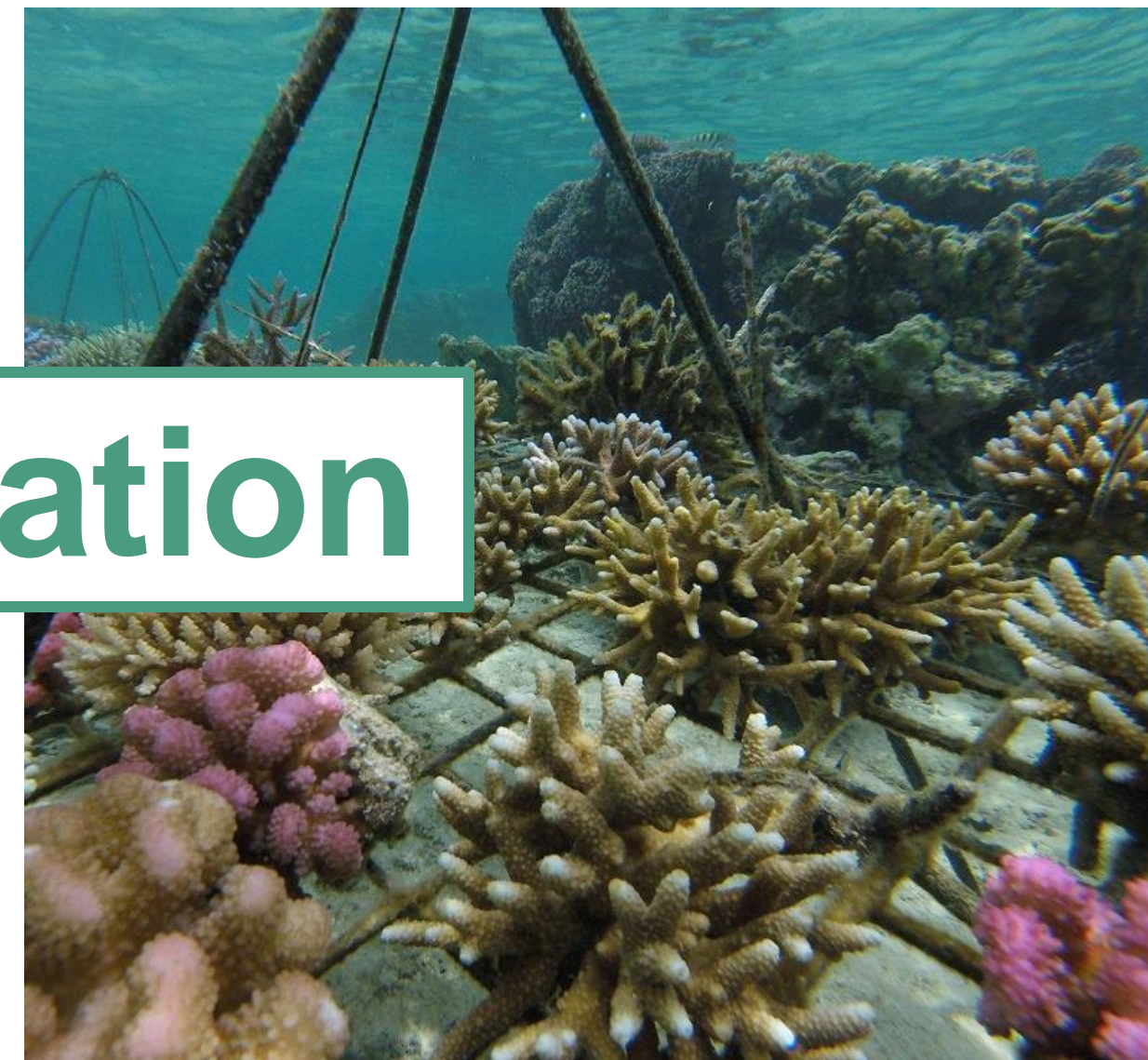


Photographs showing the difference in salt marsh growth at (a) reef and (b) control sites in 2017, and (c) seaward salt marsh expansion (photograph was taken in February, 2019).

Oyster reef - Bangladesh

Nature-Based Solutions: **unsuccess**

when we listen about NBS in coastal and marine environments, what do we first think of?



Ecological Restoration



Nature-Based Solutions: **unsuccess**

- **Improper planting techniques and lack of site preparation**
- **Poor long-term monitoring and maintenance**
- **Threats from human activities**
- **Unclear restoration goals and success metrics**
- **Lack of addressing multi-scale drivers of degradation**

Story | 21 Feb, 2017

Mass mangrove restoration: Driven by good intentions but offering limited results

There is an urgent need to address the global degradation of coastal ecosystems, but are mass mangrove planting initiatives sustainable?

<https://www.iucn.org/news/forests/201702/mass-mangrove-restoration-driven-good-intentions-offering-limited-results>

FOOD & ENVIRONMENT

Many mangrove restorations fail. Is there a better way?

These carbon-hoarding, coastline-protecting forests are sponges for greenhouse gases. Doing plantings right and involving local communities are key to saving them.

By Katarina Zimmer | 07.22.2021

<https://knowablemagazine.org/content/article/food-environment/2021/many-mangrove-restorations-fail>

NEWS | ASIA

Massive Mangrove Restoration Backfires

Philippine conservation effort dooms ecologically critical trees

15 JUL 2008

[//www.science.org/content/article/massive-mangrove-restoration-backfires](https://www.science.org/content/article/massive-mangrove-restoration-backfires)

Nature-Based Solutions: **unsuccess**

when we listen about NBS in coastal and marine environments, what do we first think of?

Resilience

Adaptation

Condition

Ecological Restoration

Cross-realm

Multi-scale



Nature-Based Solutions: Baltic Sea

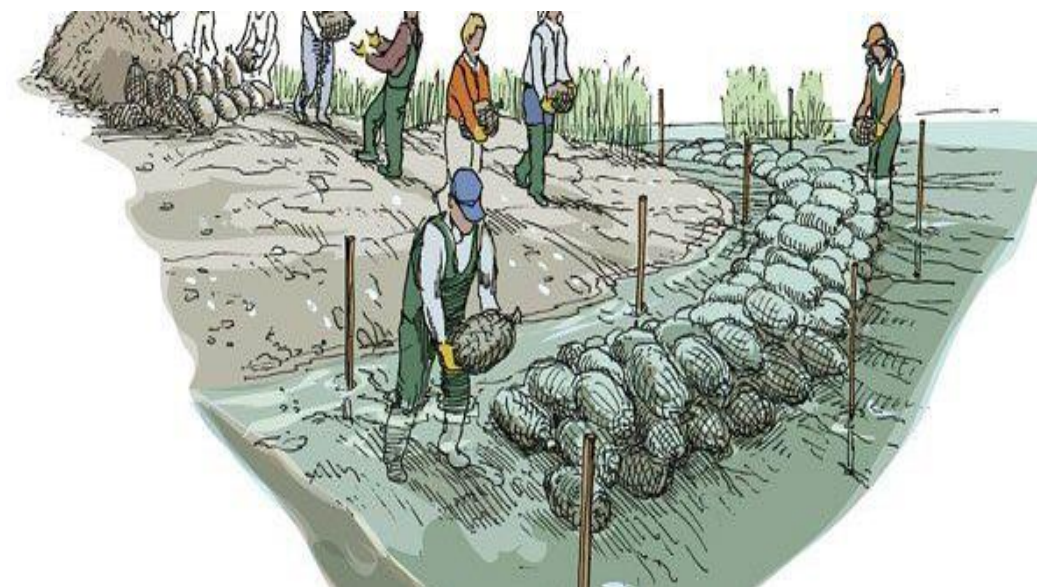
Which NBS should we prioritize?

Type 1



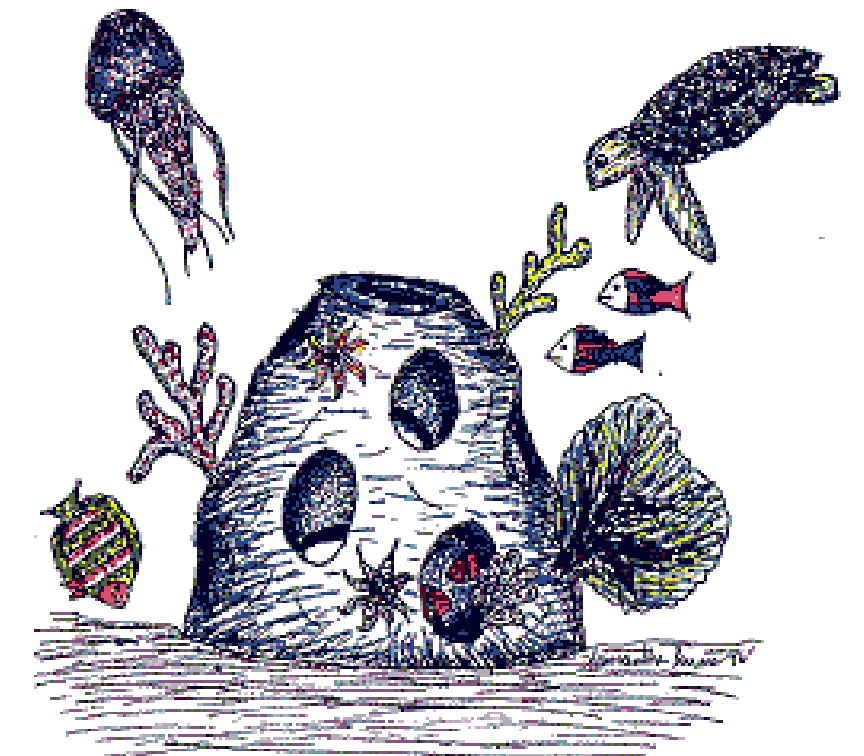
e.g. protected areas

Type 2



e.g. oyster reef

Type 3



e.g. artificial reef

Nature-Based Solutions: “umbrella” approach

Type 1



e.g. protected areas

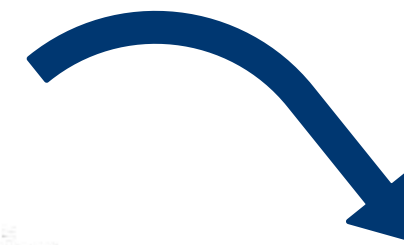
**Ecological
conditions**



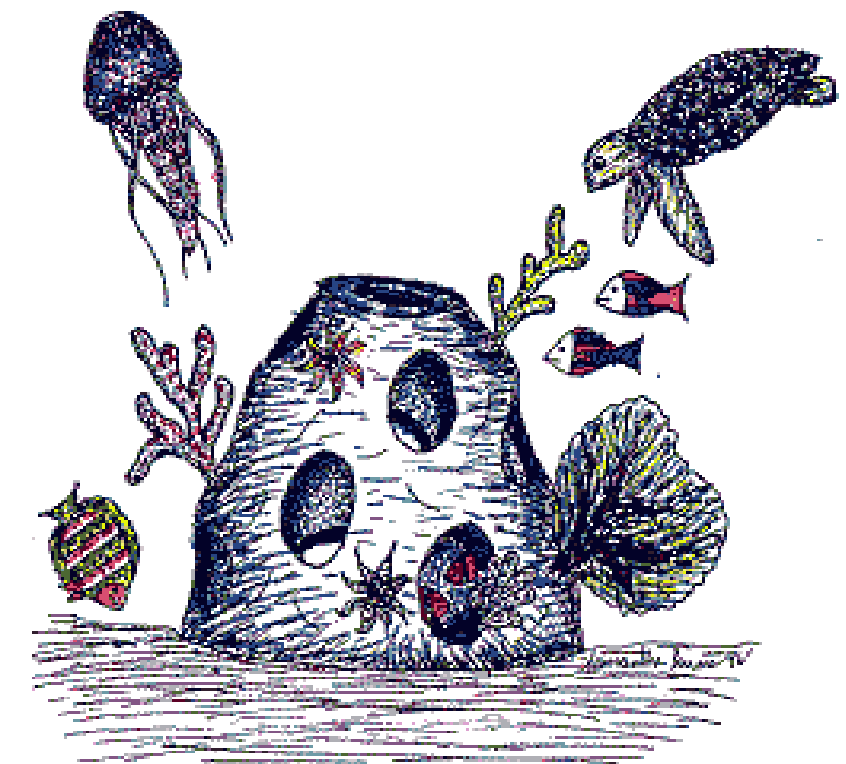
Type 2



e.g. oyster reef



Type 3



e.g. artificial reef

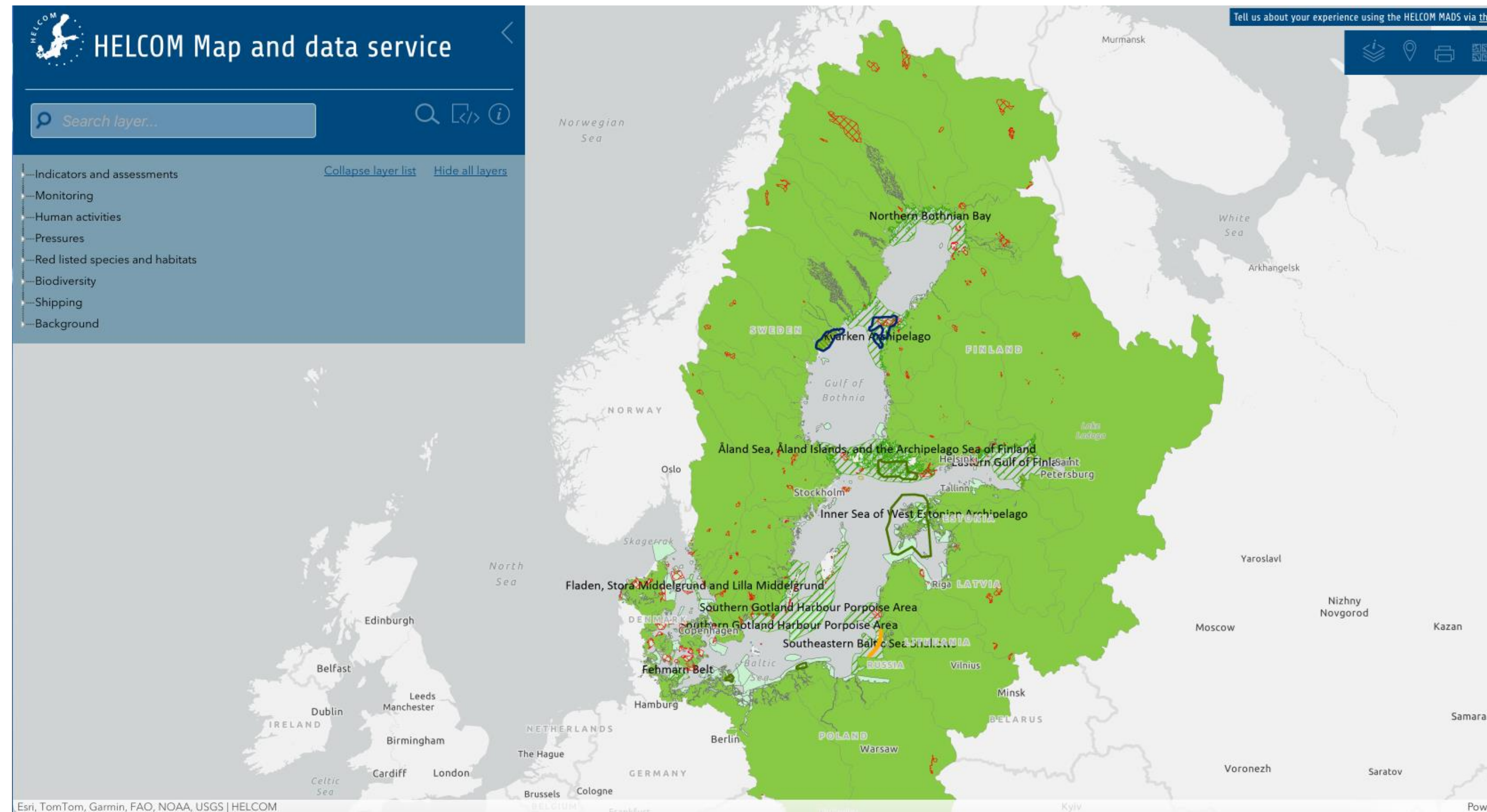
Nature-Based Solutions: “umbrella” approach

Type 1



e.g. protected areas

**Established, but fully
enforced?**

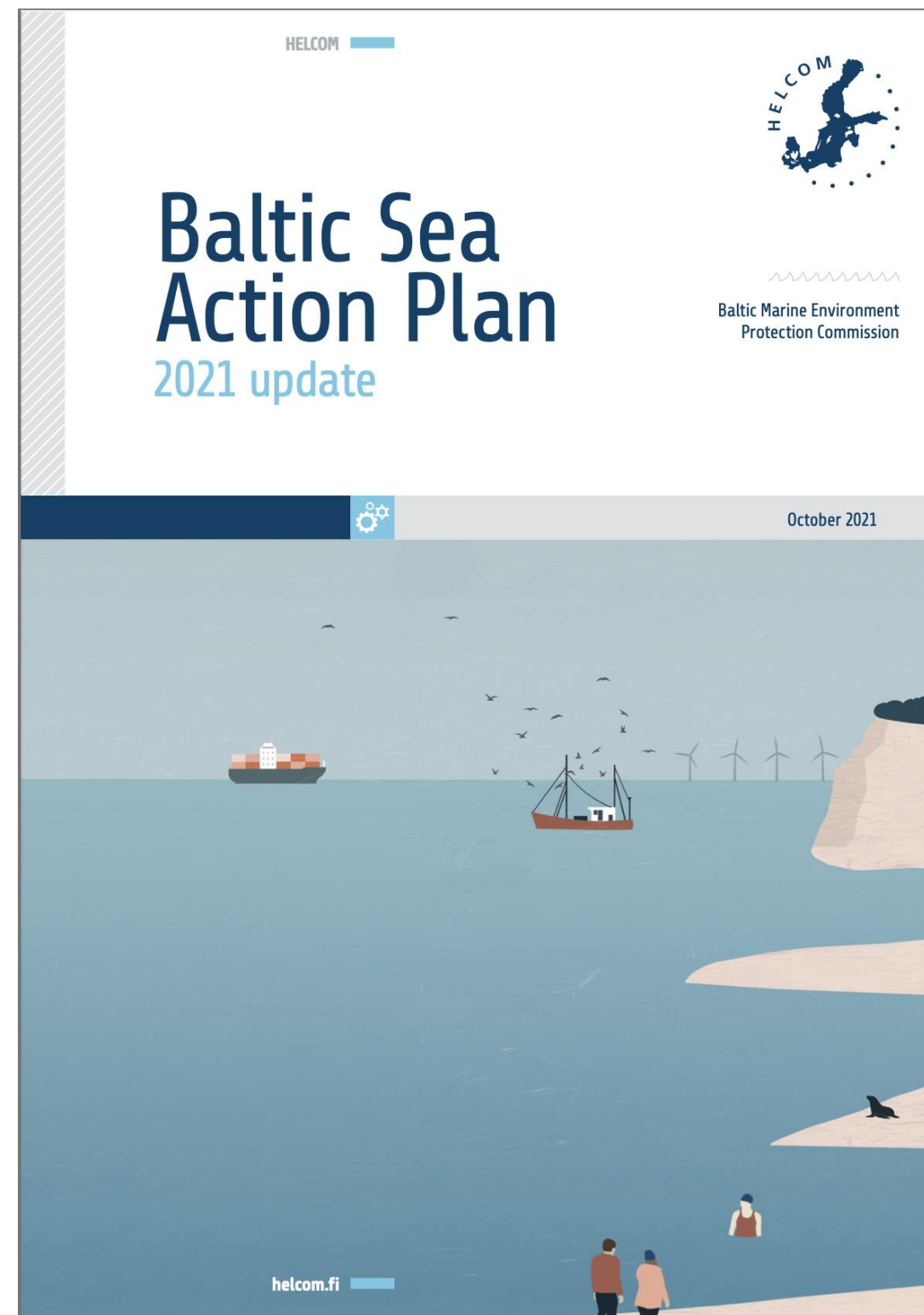


Nature-Based Solutions: “umbrella” approach

Type 1



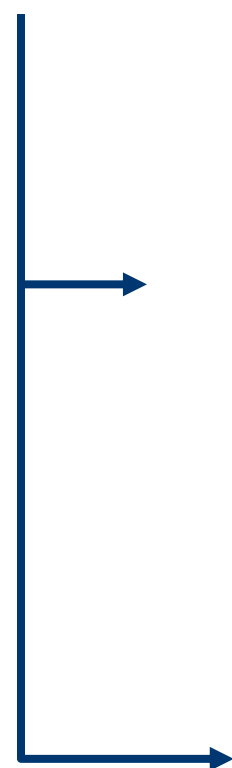
e.g. protected areas



*WFD, MSFD, MSP,
Biodiversity 2030, etc*

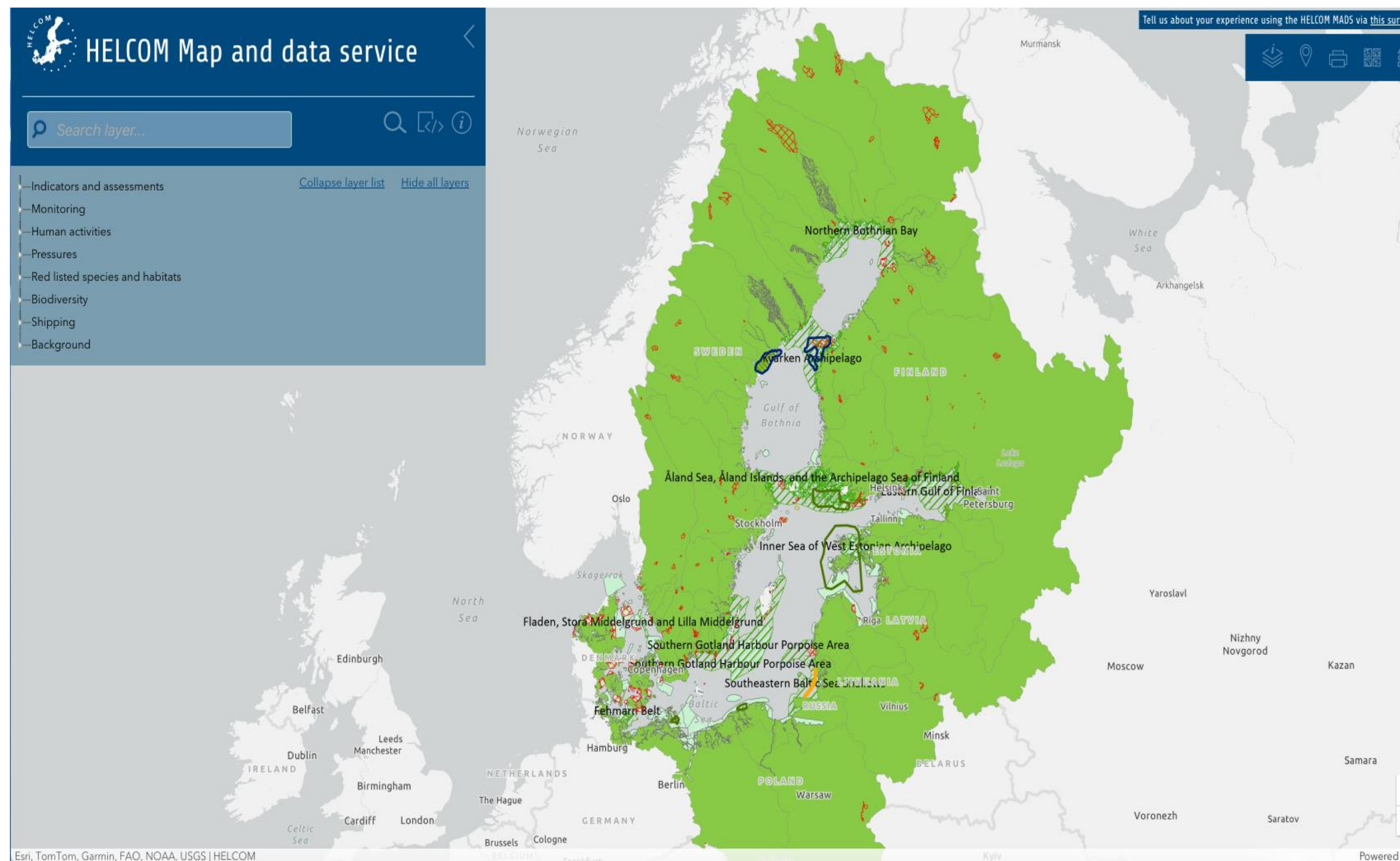
Nature-Based Solutions: “umbrella” approach

Connectivity



**Across scales
(local, regional)**

**Across realms
(terrestrial)**



Nature-Based Solutions: "umbrella" approach

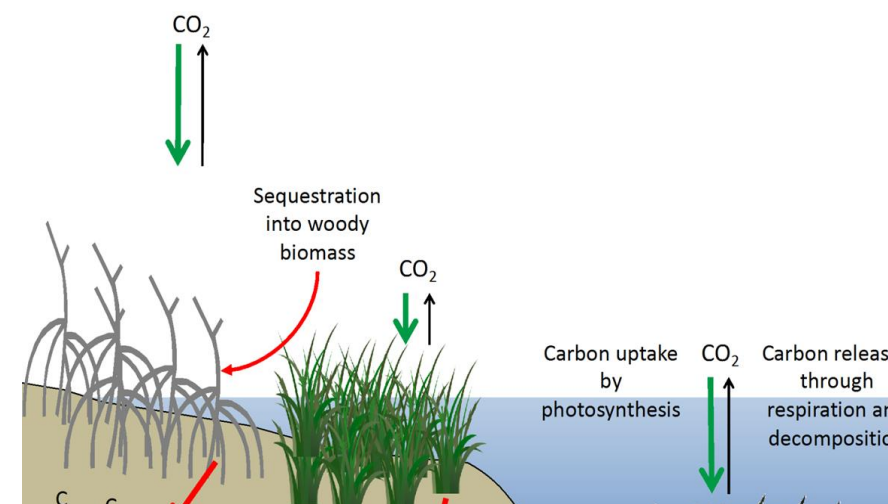
Type 1



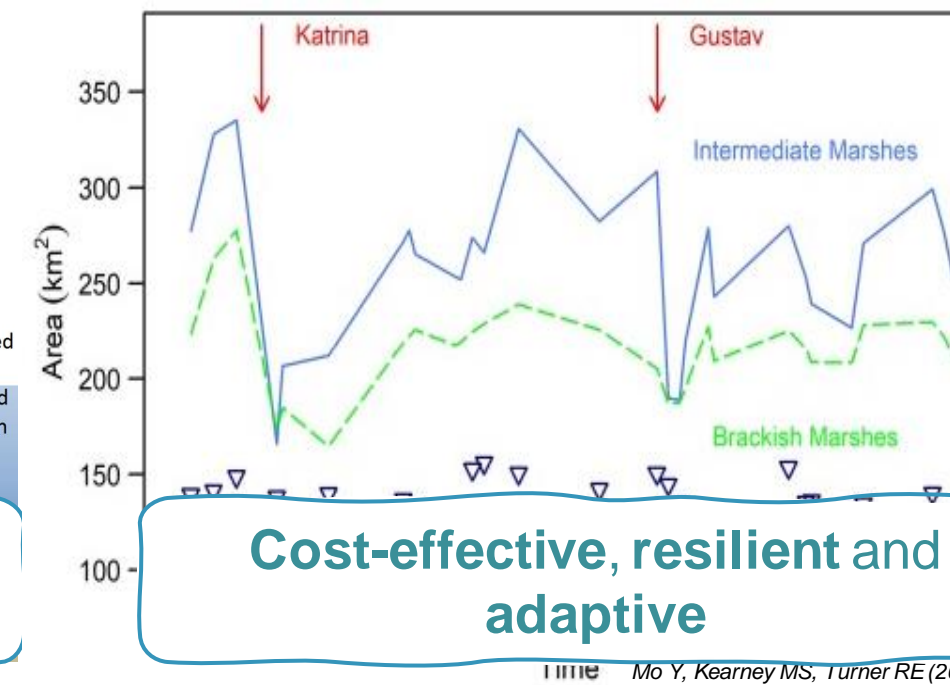
e.g. protected areas



increase habitat availability and biodiversity



increase carbon sequestration



Cost-effective, resilient and adaptive



synergies with tourism and fishery industries



support local socio-economic development



Provision of multiple ecosystem services

Nature-Based Solutions: “umbrella” approach

Type 1



e.g. protected areas

**Ecological
conditions**

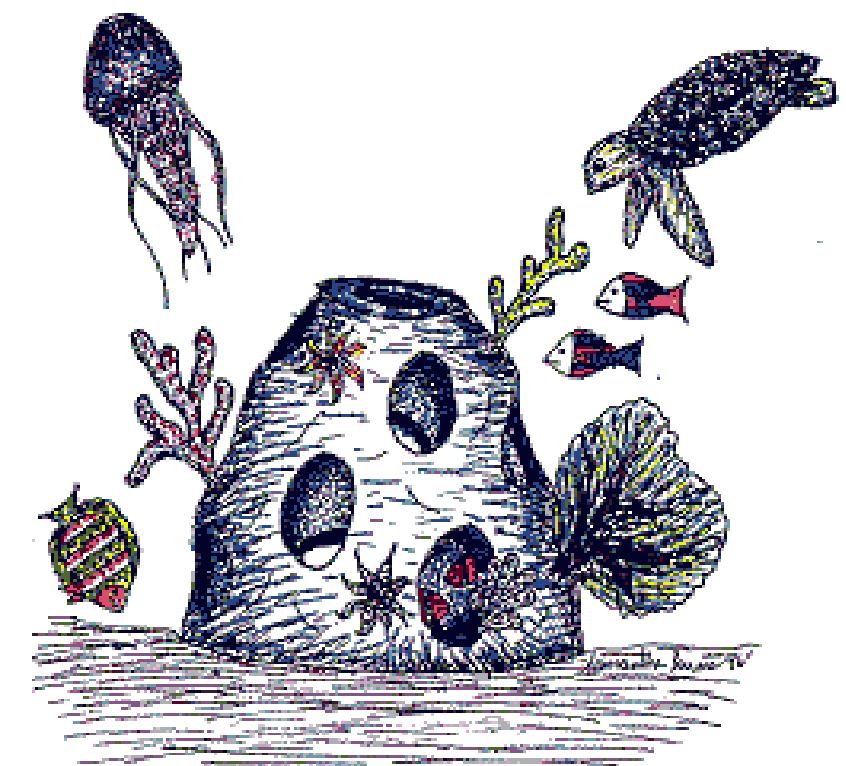
Implementation

Type 2



e.g. oyster reef

Type 3



e.g. artificial reef

Towards the coherent planning and management of nature-based solutions for the effective protection and restoration of Baltic Sea ecosystems

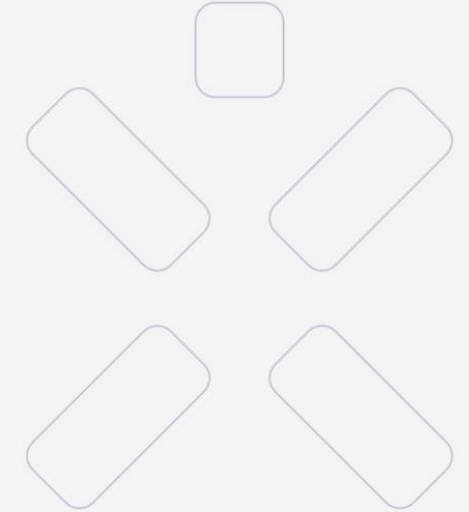
Ignitis Renewables goes offshore: how to balance clean energy production and environmental protection?

Ignitis Group purpose is to create a **100% green and secure energy ecosystem** for current and future generations.

Strategic priorities

Delivering 4-5 GW of installed green and flexible capacities by 2030 with a focus on:

- Offshore wind
- Onshore hybrid
- P2X & storage



Ignitis Renewables **implements the strategic goal** of Ignitis Group and significantly contributes to national energy independence objectives.

For the best results

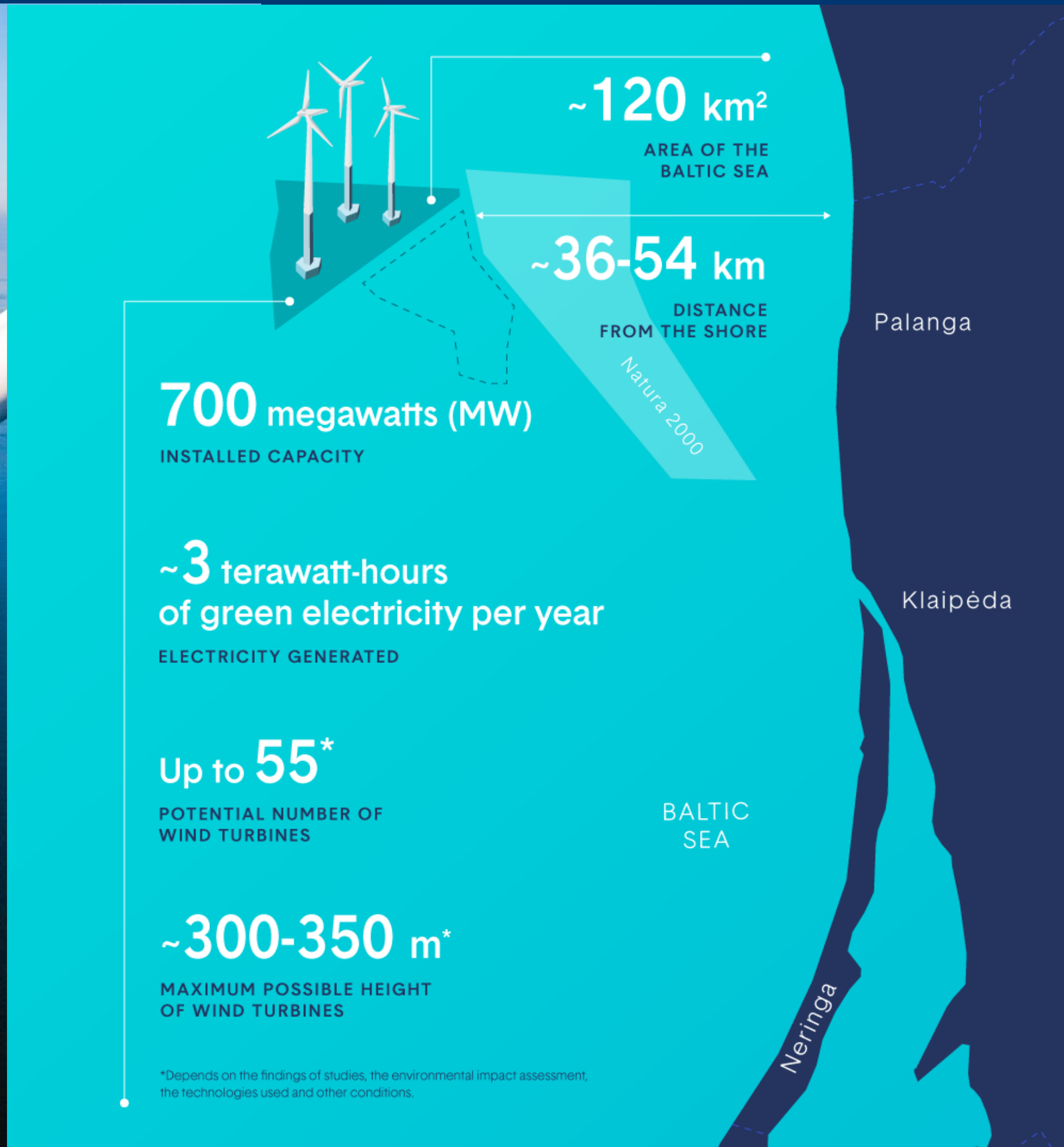
The team of highly skilled experts in the OWF development team from:

- Lithuania
- Germany
- Denmark
- The UK
- Spain
- Greece



Management





Ignitis Renewables environmental approach



Protected areas

→ 2 km away from the protected area.

Biodiversity

→ Bats sonars in the OWF area;

→ Continuous 24 months of birds monitoring;

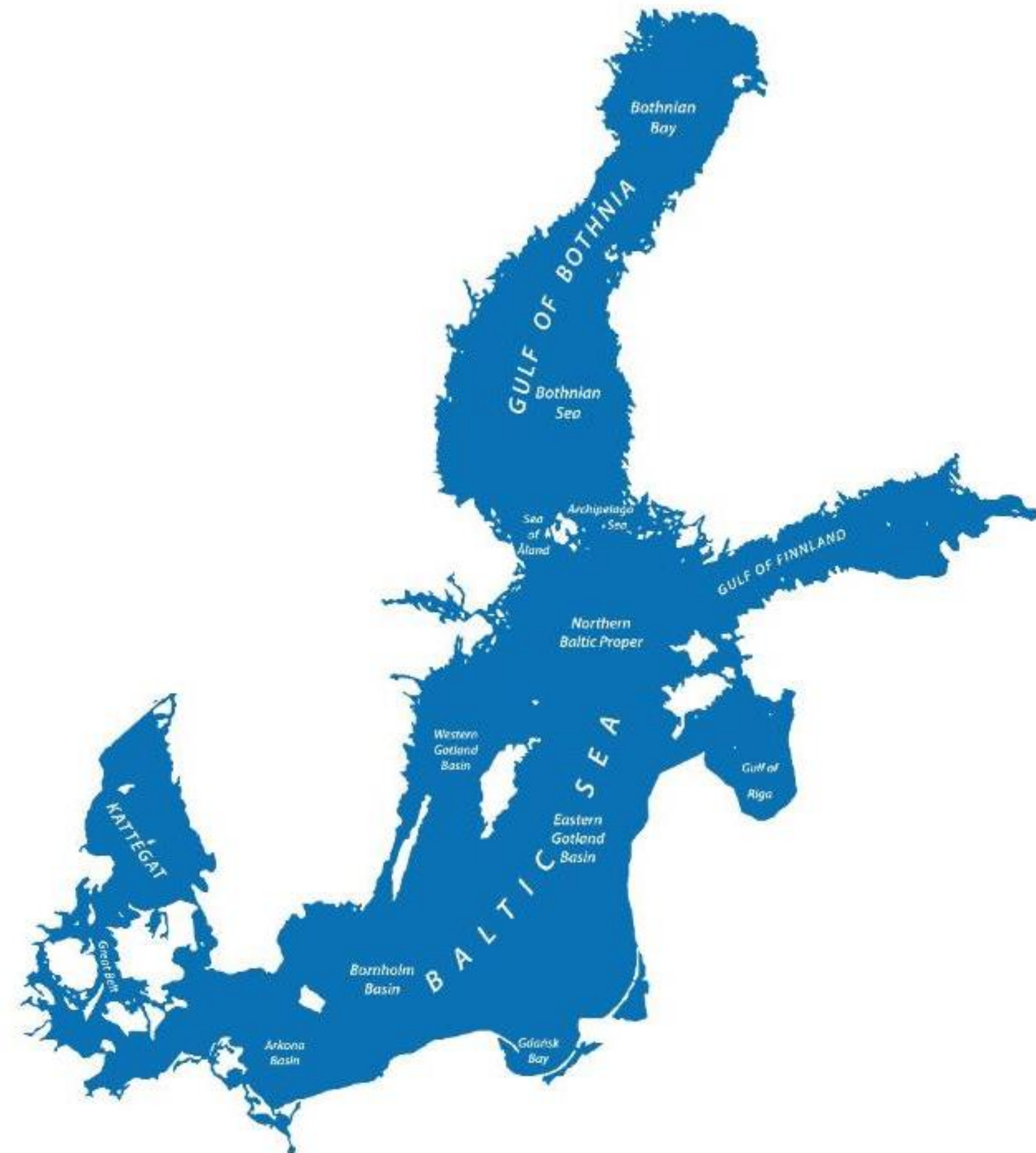
→ A refuge for fish;

→ Artificial reefs;

→ Exploring innovative monitoring methods and other ways to contribute to ecosystems.

Awareness raising

→ Supporting "Save the Baltic" expedition.



Beyond a pond: collaborative efforts to enhance balance and management across the Baltic Sea

- Thorough and scientifically based territorial planning for OWF development at the state level.
- Close cooperation with authorities.
- Unified EIA requirements across the region and continent to facilitate entry into new markets.
- Stakeholders engagement from the earliest stages.
- Clear and unified investors' requirements.
- Aligned methods of surveys and monitoring for comparable results.
- Clear methodologies for cumulative impacts assessment.

Thank you