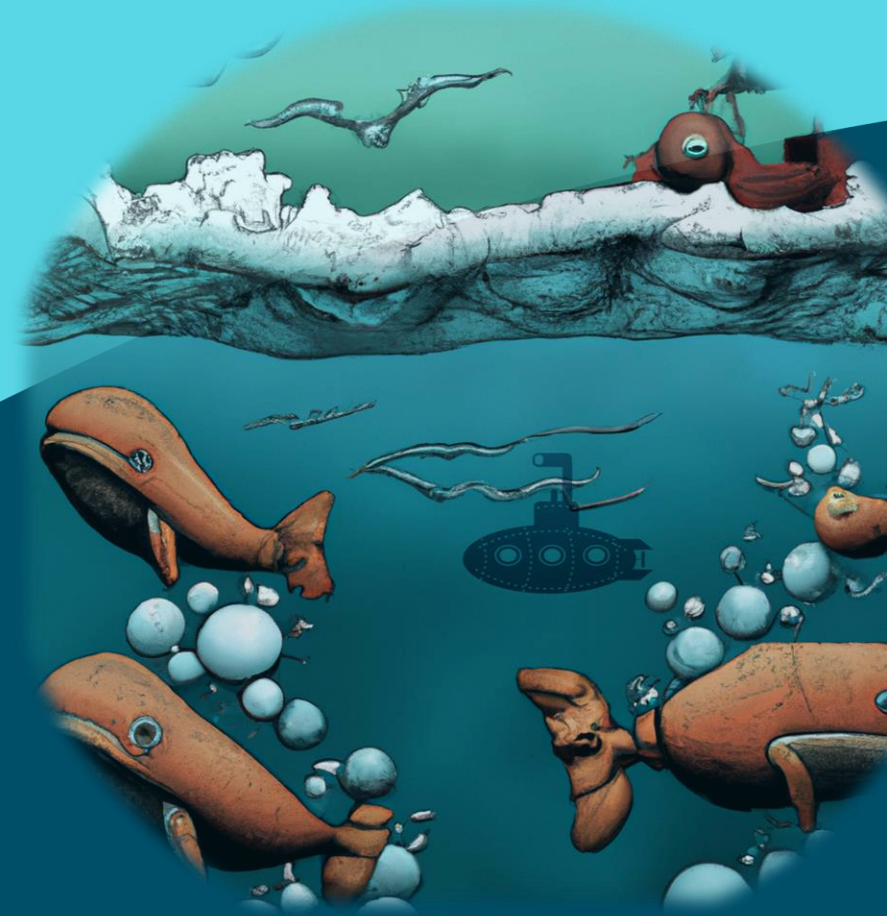


# Developing ecoregions to deliver EAFM in deep sea RFMOs

Mark Dickey-Collas





# EAFM/EBFM

*"... policy, strategy development, & implementation processes required to adapt **fuzzy principles** & conceptual goals to reality of specific situations."*

*"Decades-long process of elaboration of foundations for sustainable development, aiming at both human & ecosystem well-being."*

*Garcia & Cochrane 2005*



DickeyCollasMarine

# Ecosystem-Based Fisheries Management



Based on set(s)  
of principles



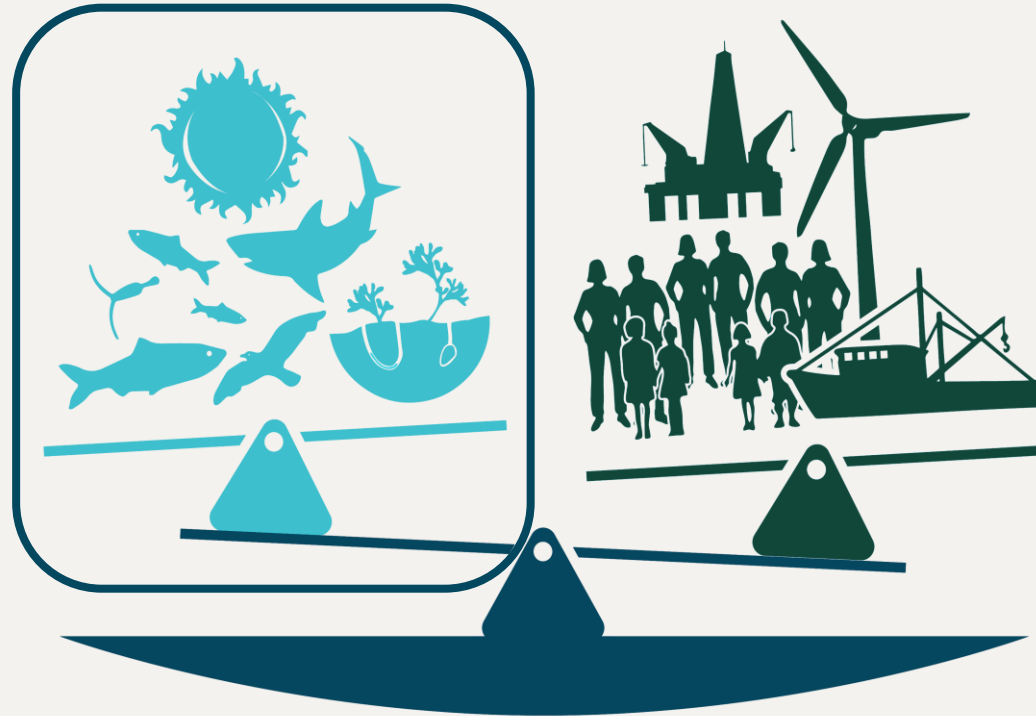
Concepts  
of balance &  
trade-offs



# Ecosystem-Based Fisheries Management



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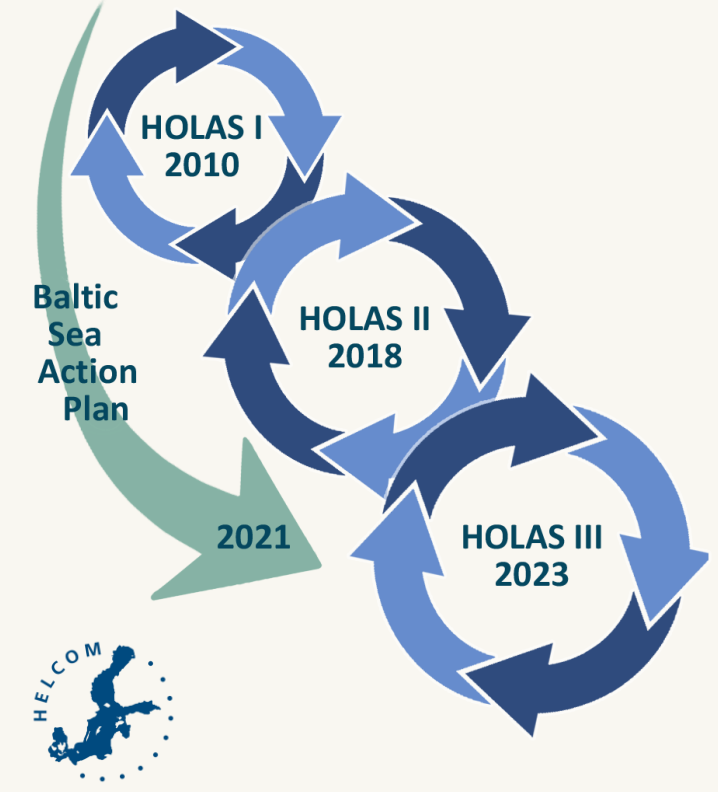
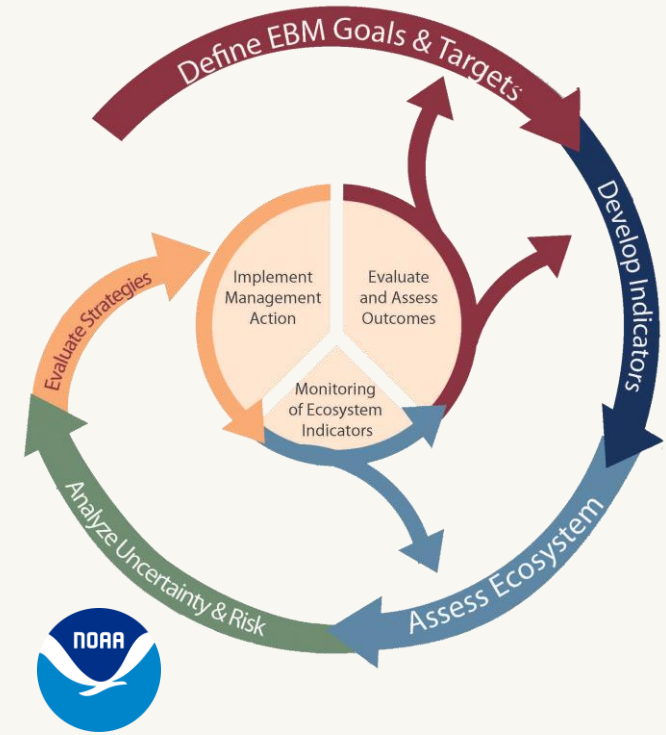
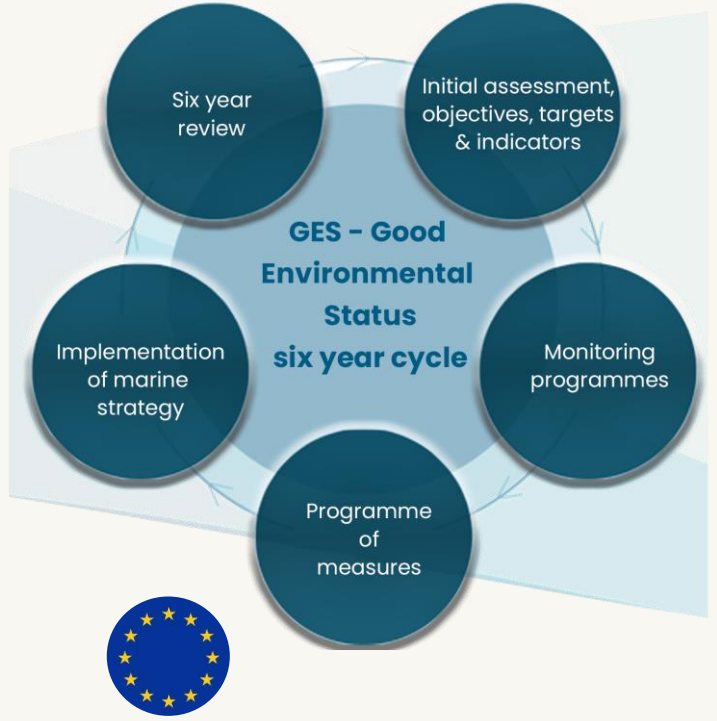


Concepts  
of balance &  
trade-offs





# Cycles & iterations



# Handy framework: FAO EAF implementation tool



## 1. Ability to achieve

Process, governance, institutional & external drivers



## 2. Ecological well-being

Retained/non retained species, ecosystem & habitats



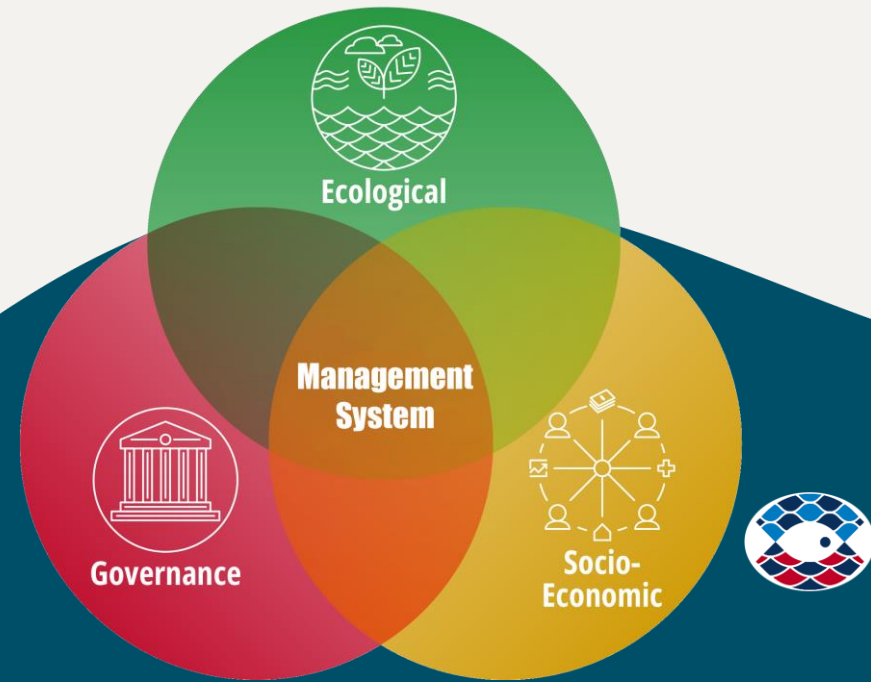
## 3. Human well-being

Social, economic & cultural: livelihood, food & nutrition security, health & safety, equity



# Evidence based

Enabling knowledge & tools:



- Indicators & metrics for EBM [\*Haugen et al 2024\*](#) [\*Papadopoulou et al 2025\*](#)
- Transformation & systemic change [\*Fulton 2021\*](#) [\*IPBES 2024\*](#)
- Understanding social-ecological resilience [\*Mason et al 2022\*](#)
- Implementing EBM & marine spatial planning [\*Galparsoro et al 2025\*](#)
- Values & valuing nature [\*IPBES 2022\*](#)





# Action: prioritisation of measures

Shift from mapping/evaluating system to focus on actions to mitigate threats



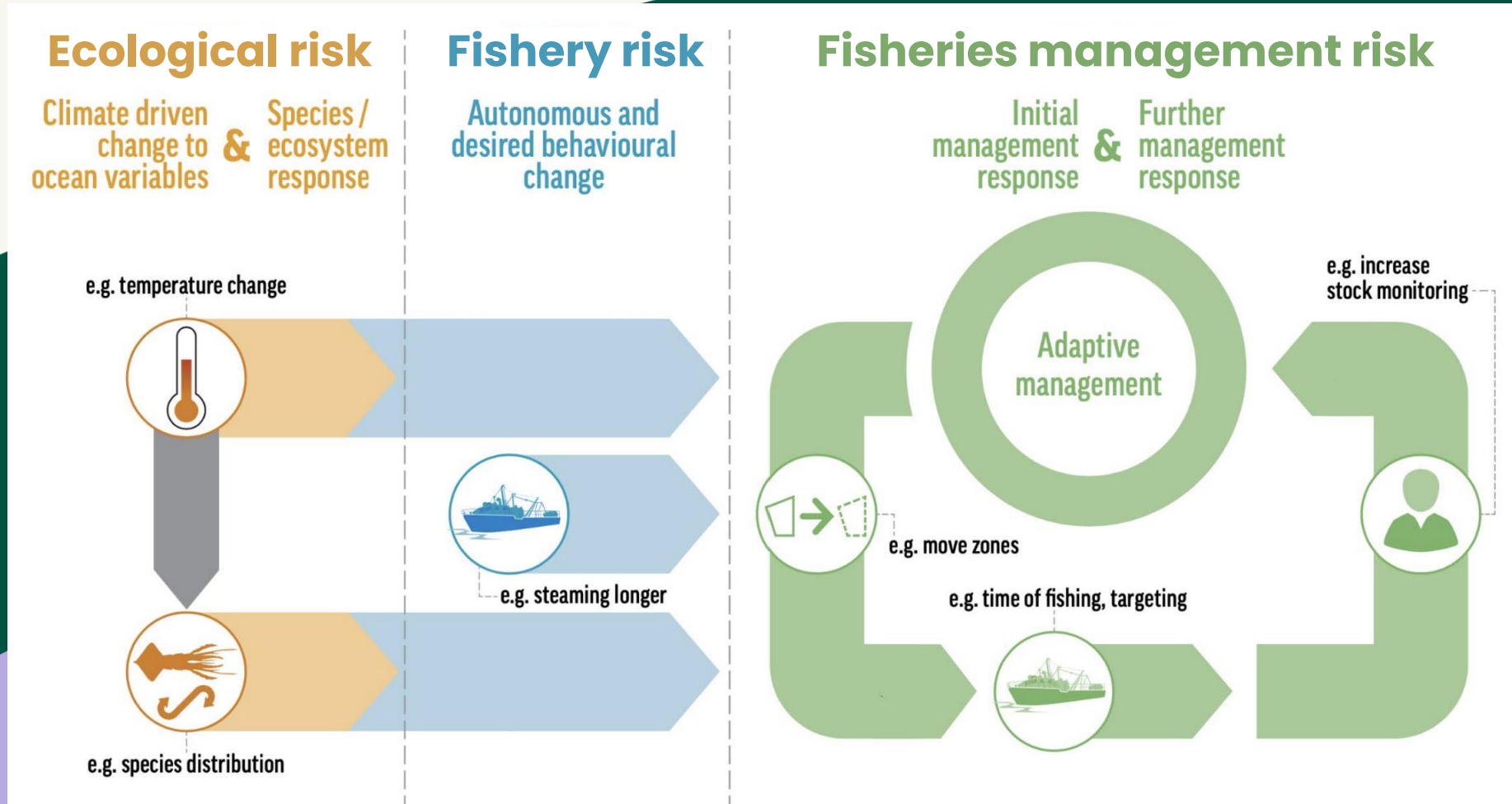
## Refrom provision of knowledge & science

Experts promoting collaborative quantitative & qualitative risk assessments enabling measures for EAF/EBFM

*Hobday et al 2011, Cormier et al 2013 Holsman et al 2017 Fulton et al 2019 Stelzenmüller et al 2020 Roux et al 2021 Pedreschi et al 2023 ICES 2024*



# Risk-based approaches



# What is an ecoregion?



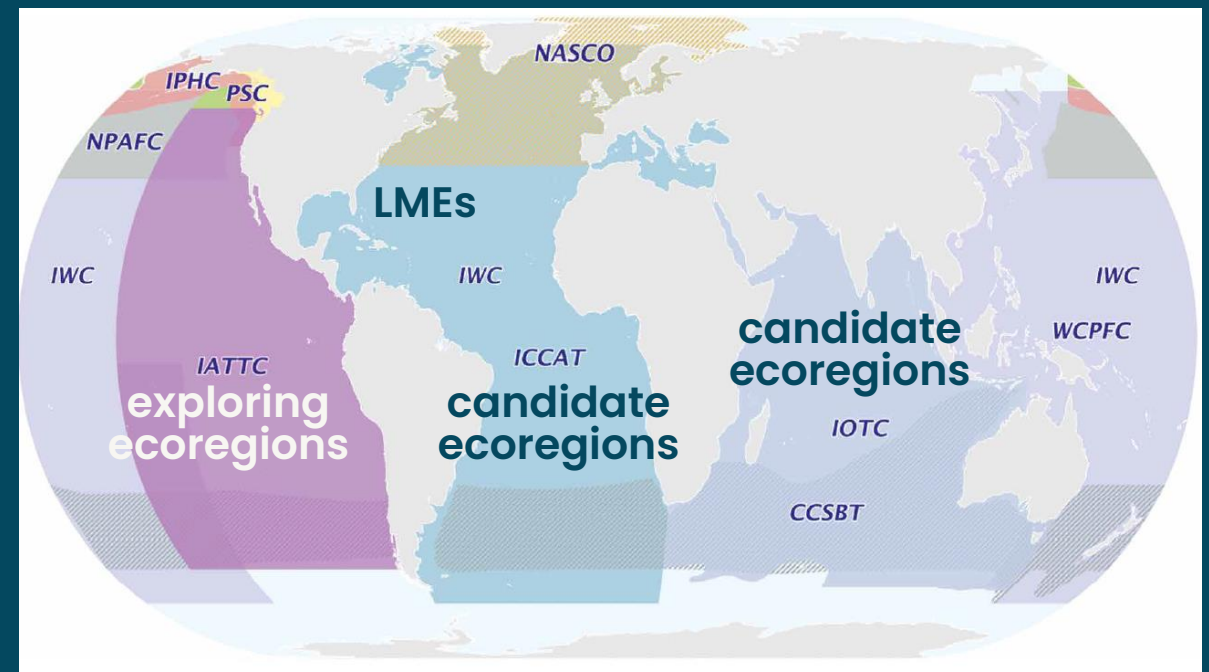
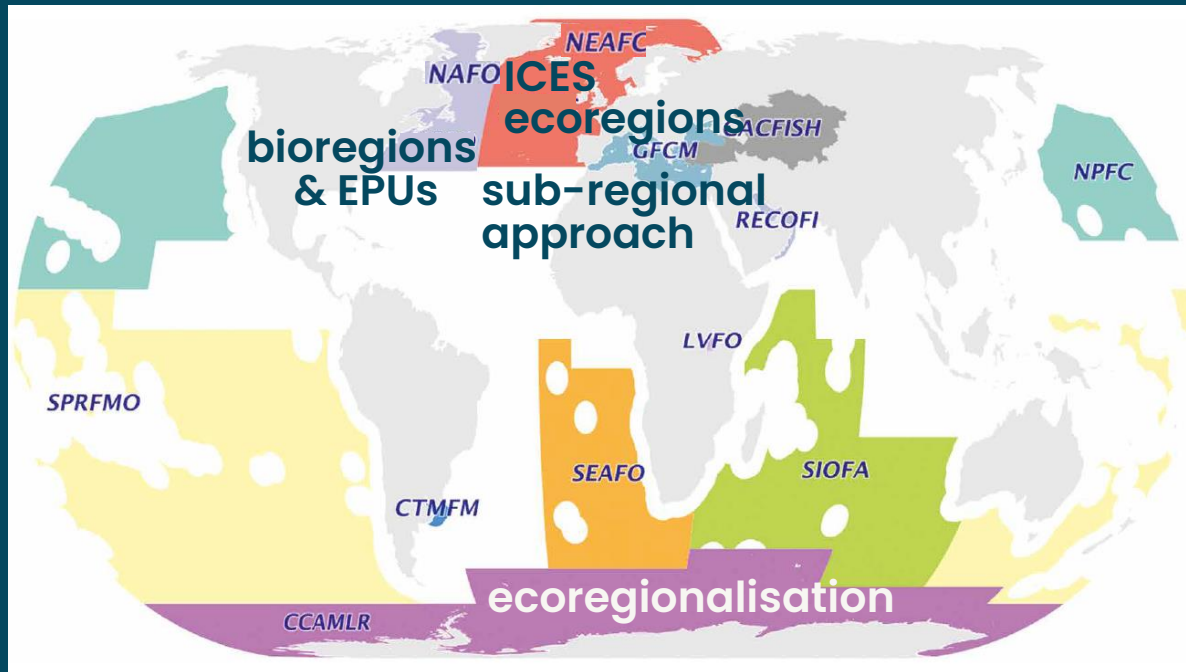
Ecoregion provides **spatial** framework for conservation planning, resource management, & research.

## My background:

ICES uses ecoregions as spatial units to synthesize evidence for ecosystem approach ...to monitor, assess, address, & solve regional scientific challenges.



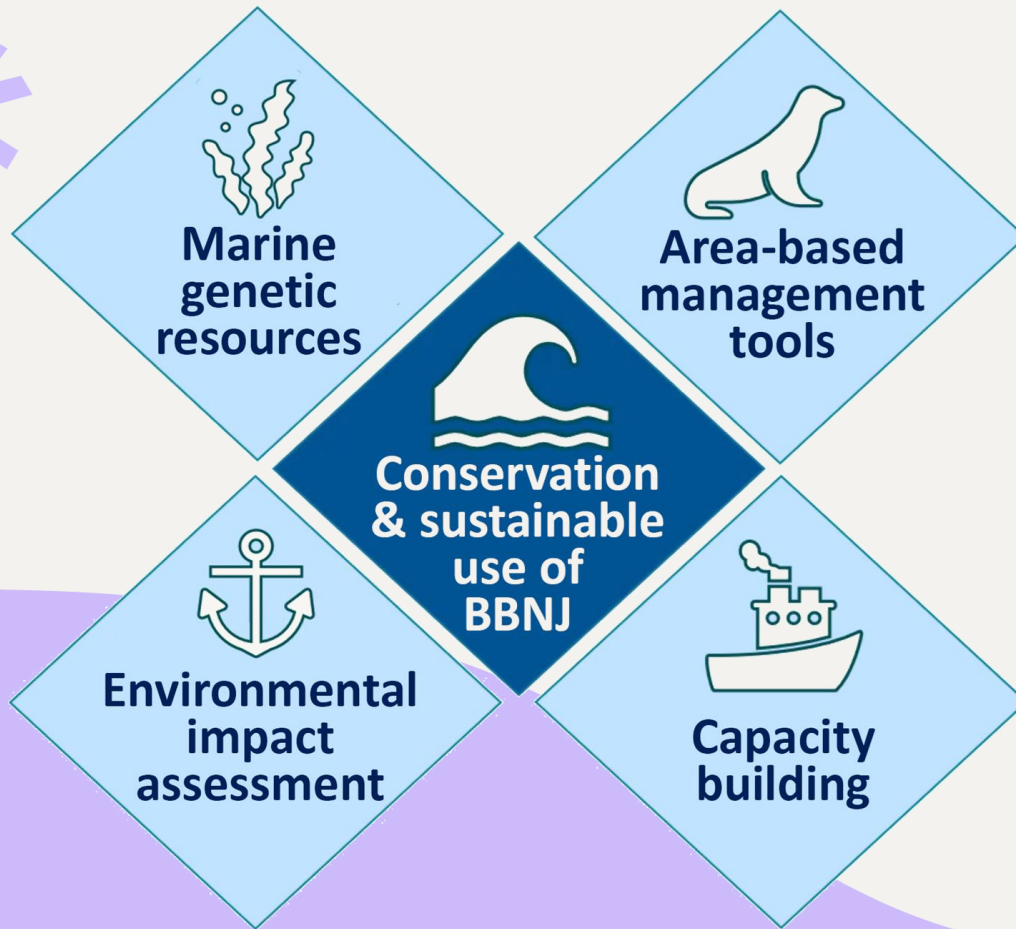
# Ecoregions in RFMOs



Objectives for use varies: science & monitoring, conservation, sustainable management



# Relevance of spatial approaches: UN BBNJ agreement



Resources & guides  
IUCN Fisheries Expert Group

# Constructing ecoregions: Tension between science & management/conservation



Ensuring effective science into decision-making:

- Inclusivity & plurality of knowledge
- Accounting for diverse values
- Variable changing landscapes (ecological, economic, social)

**Tools to support EAF decision-making must not be naïve to arena & use of knowledge.**



# Slow pace: we operate in conservative arena



Overcoming path dependency  
& cognitive bias

## Decision making

### ISSUE

Loss access or money, high uncertainty, taboo values

### BIAS

Loss aversion, suspicion of missing info, trade-off aversion

### RESPONSE

Conflicted feelings, inflexibility, seek more information, fill blanks

### OUTCOME

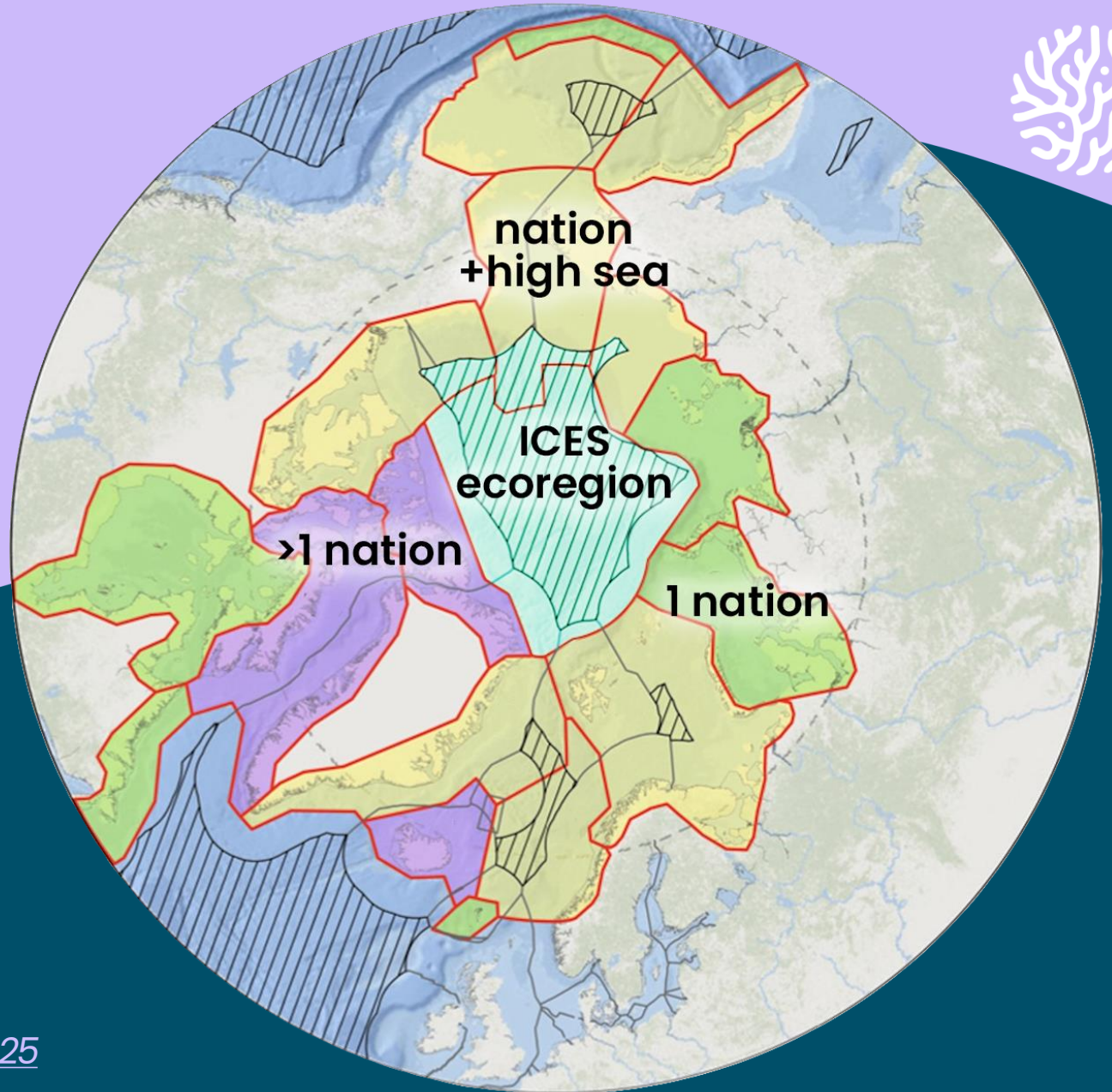
Negative emotions, deceived, backfire... leading to inaction





# Boundaries

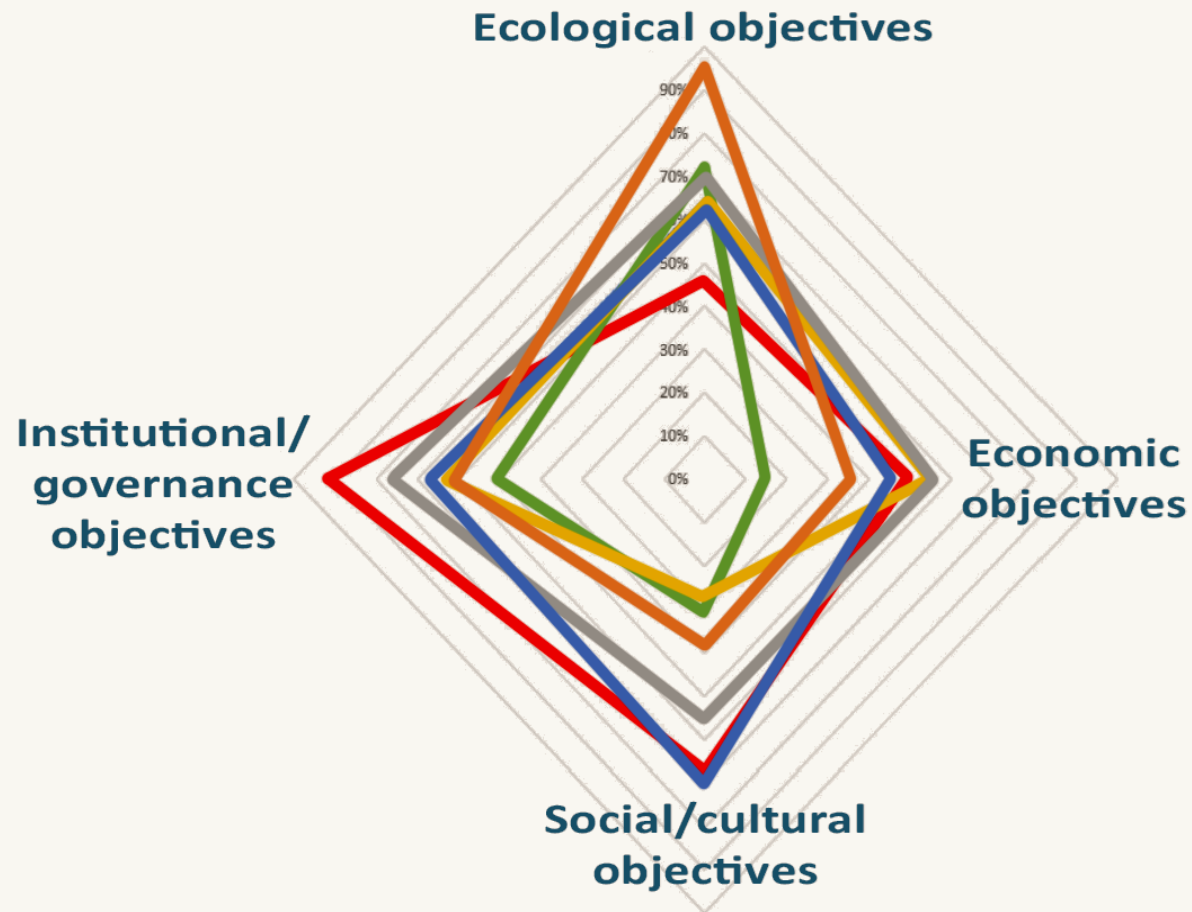
e.g. Central Arctic Ocean



18 Large Marine Ecosystems  
(LMEs) & systems change  
Names & borders

*PAME 2013 ICES 2022 de Oliveira Heinrich 2025  
Thanks to Lis Lindal Jørgensen*

# Delivering sustainability objectives: acronym & concept soup



## Quilt of sustainable ocean governance: patterns for practitioners

- social-ecological systems
- ecosystem approach
- integrated management
- marine spatial planning
- participatory co-management
- precautionary approach



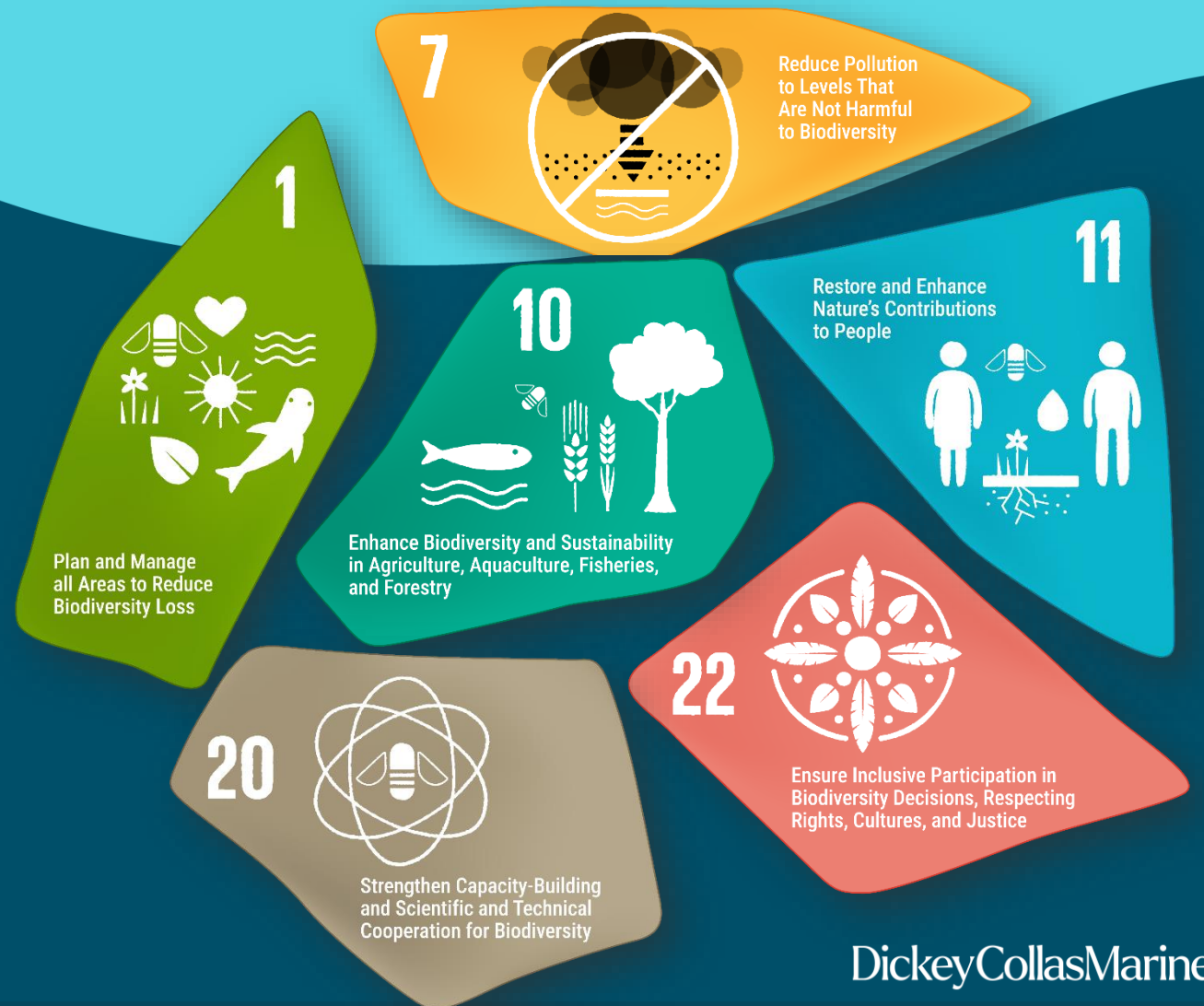


# New on the block: KM Global Biodiversity Framework



## Grounded in EBM, 23 targets for 2030

1. Reduce threats to biodiversity
2. Meet people's needs through sustainable use & benefit-sharing
3. Tools & solutions for implementation



# GBF targets & EAFM principles #



## biodiversity for ecosystem services



## conserve & restore



## sustainable use



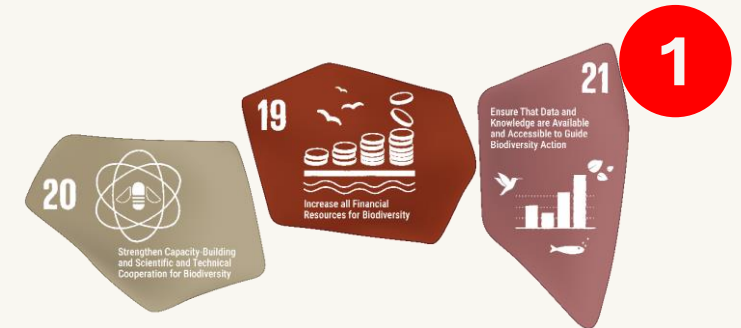
## climate & change



## scale of management



## knowledge & capacity

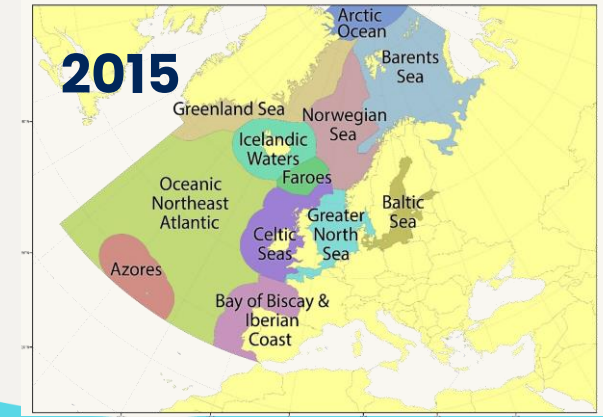
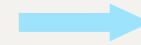
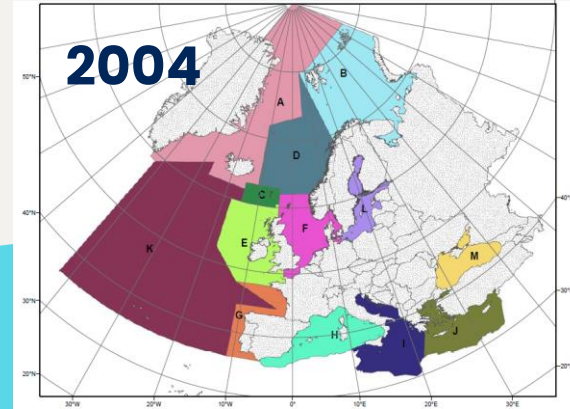
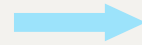
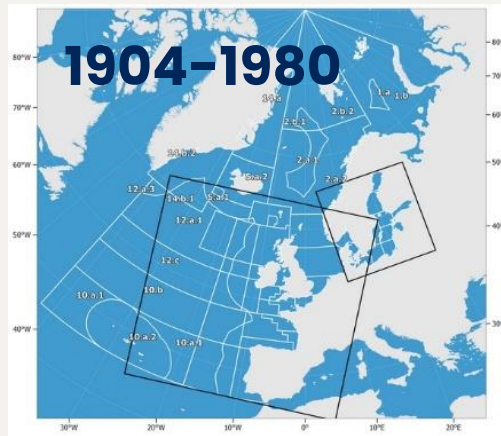


## institutional



CBD & FAO Principles: *Haugen et al 2024*

# Development of ICES ecoregions



- Collect fisheries statistics
  - Fish stocks associated with fishing areas
- Still used in many instances

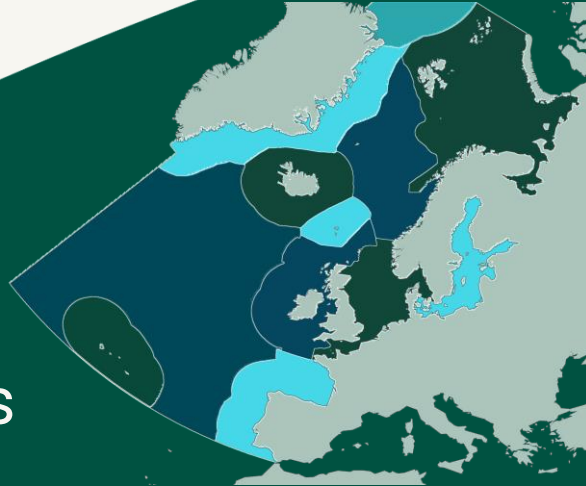
- Individual regional areas for ecological objectives
- For research, management, assessment, monitoring

- Clarify borders
- Underpin regional advice
- Bring advice for EBFM & EBM together
- Enable regional innovation

# Creation process



Evaluated across  
22 criteria



Evaluated existing systems:

- OSPAR regions
- ICES fishing areas
- Large Marine Ecosystems
- Longhurst Provinces
- Dinter Biogeographical Regions
- EU regional Advisory Council

Ecoregions proposed based on  
biogeographic & oceanographic features, taking account  
of existing political, social, economic & management divisions

# Ecoregions – useful tool for EAF/EBFM



- Integrate many processes in the cycle of EAF
- Recognise strengths & weaknesses
- Expect challenges when defining
- Prepare for change

## **Prioritise:**

- **Solutions**
- **Partnership**
- **Action**

- Don't be distracted by complexity in concepts, most are heading in similar direction
- Disciplines will be wedded to their existing systems for regionalisation

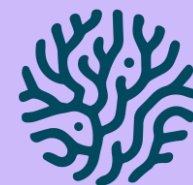


# Best practice

- Adopt ecoregions with commitment & visibility, illustrating ecosystem approach is core to your science & management.
- Determine criteria for regions across range of categories/disciplines; ensuring criteria include ecological & social.
- Be sensitive to issue of names – cultural, disciplinary or political connotations.
- Engage early & often; design iterative process.
- Link to GIS system, & document & archive each decision, they may be challenged later.



**Thanks!**



**DickeyCollas  
Marine**

Science For Sustainable Sea & Ocean Management