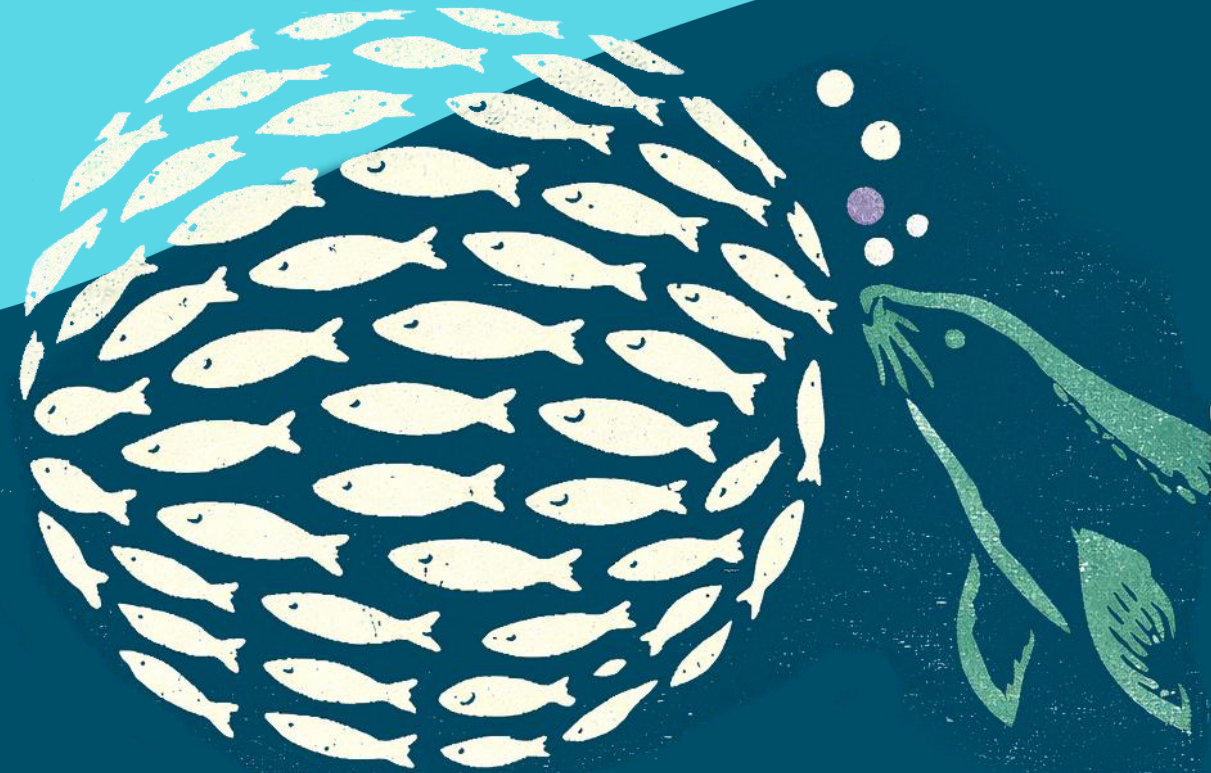


From mapping to measures: operational EAF for small pelagics now

Mark Dickey-Collas,
London, UK



Navigating changes in small
pelagic fish & forage
communities. La Paz 2026



DickeyCollas
Marine

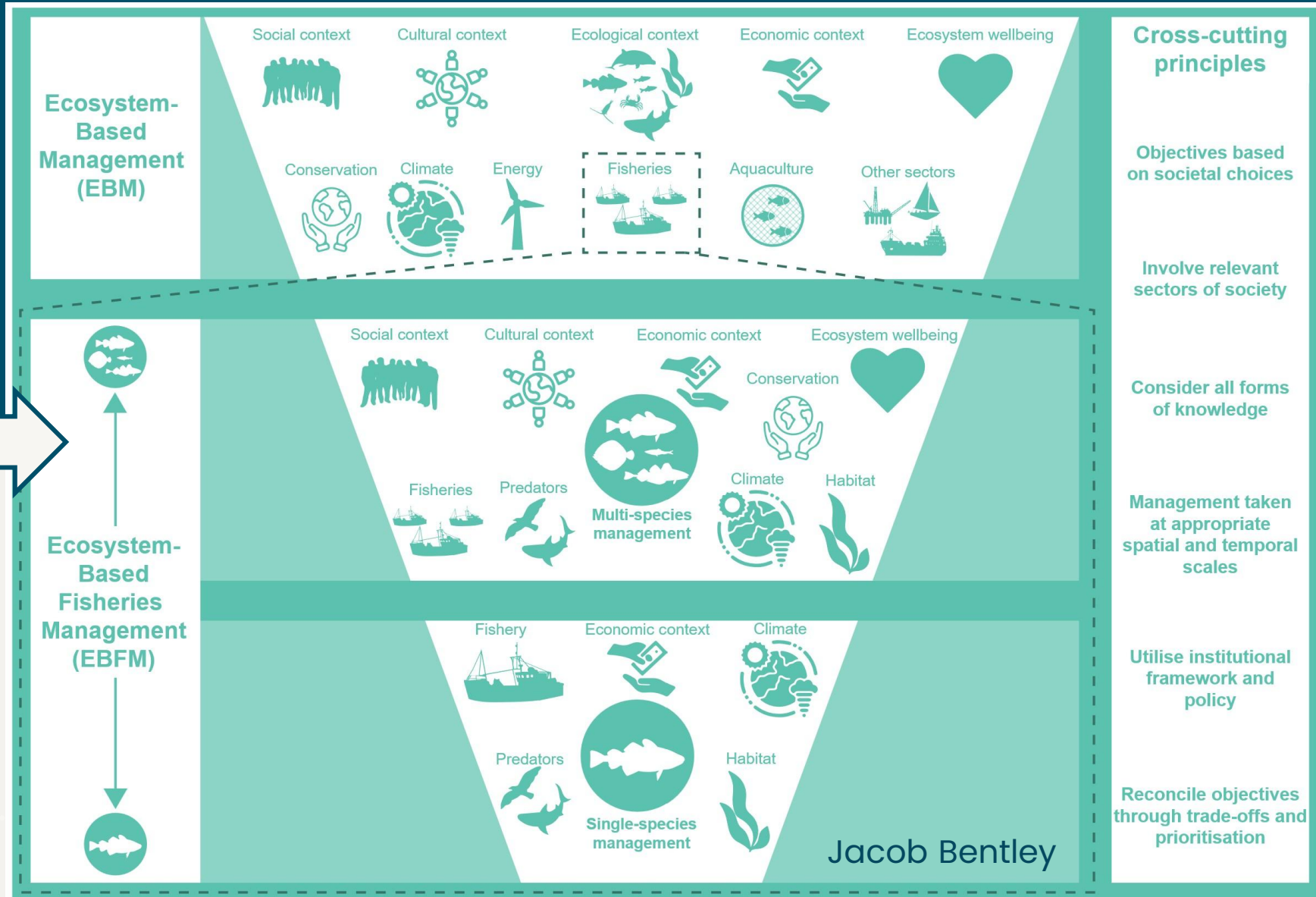
Science For Sustainable Sea & Ocean Management

Ecosystem-based fisheries management

EBFM/EA FM



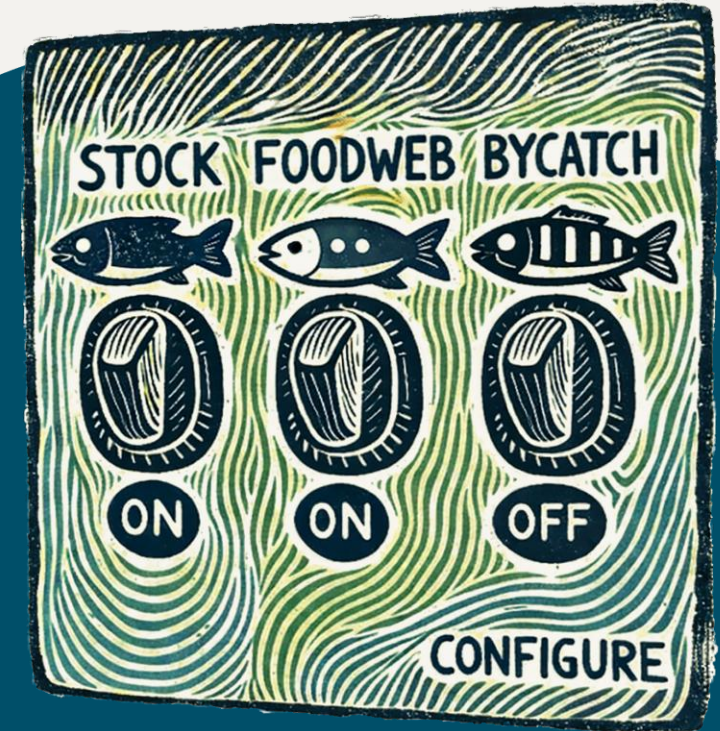
EAF = effective & impactful management



EAF/EBFM matters for pelagic fisheries



EBFM is not a policy choice.
Management framework required
by international law &
commitments



Cannot fulfil legal obligations by:

- managing species one at a time
- ignoring what fishing does to the broader ecosystem
- failing to act precautionarily with uncertain evidence

*UNCLOS (1982) Art 61, 119 & UN Fish Stocks Agreement (1995) Art 5, 6, annex II,
GBF Targets 5 & 9*

Where do we stand?



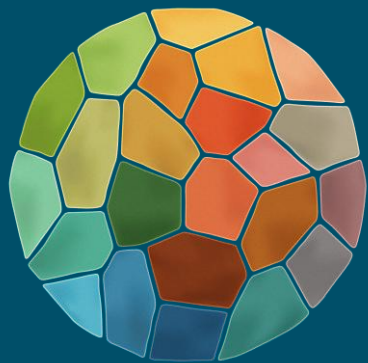
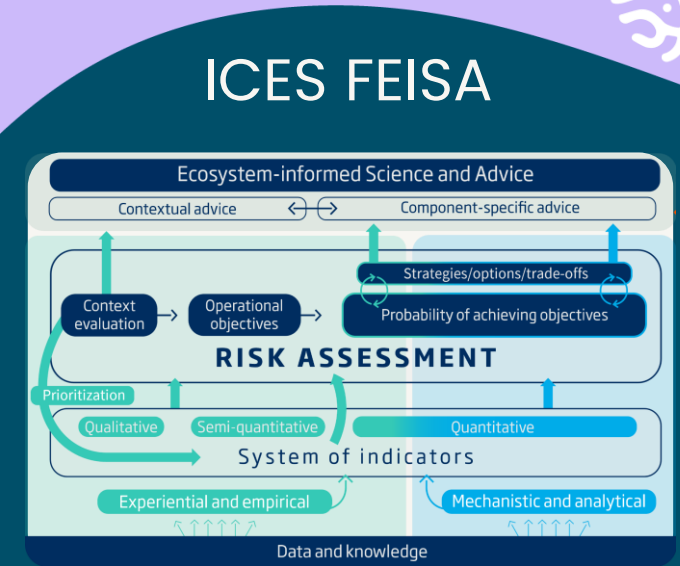
Frameworks & community of experts

FAO EAF implementation tool

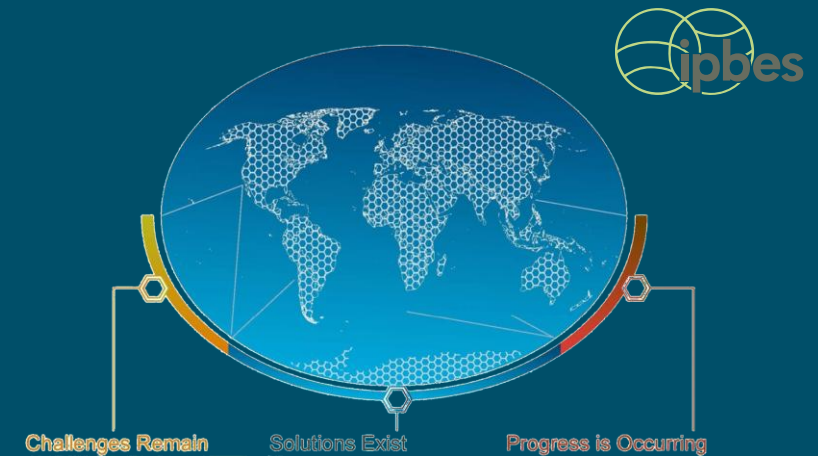
1. Ability to achieve

2. Ecolog. well-being

3. Human well-being



- CBD Global Biodiversity Framework
- UN Fish stocks agreement
- BBNJ agreement



Not starting from scratch, we already know



- **Mandates exist**
- **Barriers to progress are not scientific**
- **Focus on process for delivery**
- **Externalities matter**



Shift: *"we cannot do EBFM yet"*
to *"we could do it, but we are still
not organized, committed, or brave
enough to do it effectively"*

Aim for 100%
managed

Science implementing management, not many gaps



Indicators & metrics

[Haugen et al 2024](#)

[Papadopoulou et al 2025](#)



Marine spatial planning

[Galparsoro et al 2025](#)



Transformation & system change

[Fulton 2021](#) [IPBES 2024](#) [Levin et al 2021](#) [Toomey 2023](#)



Values, power & nature

[IPBES 2022](#) [Muhl et al 2023](#) [Singh et al 2021](#) [Pettorelli et al 2025](#)



Understanding social-ecological systems

[Mason et al 2022](#) [Norström et al 2020](#)



Simulation & management options

[Plagányi et al 2014](#) [Sainsbury et al 2000](#) [Kaplan et al 2021](#) [Duplisea et al 2021](#) [Rice et al 2025](#)

Implementation for pelagic fisheries in heterogenous world



Differing characteristics & qualities

- knowledge base & veracity
- productivity changes
- acceptable risk thresholds
- governance approaches



No 'one size fits all'

lean indicators, risk-based rules, stress-tested harvest rules under shifting productivity, transparent science processes, & a learning cycle

e.g. [Plagányi & Essington \(2014\)](#)



Traditional fisheries science knows what levers to pull

namely, **fishing mortality**
& evaluate consequences of action for conservation & maximising benefits.

Why don't we have a similar approach for EBFM?

We lose sight of levers



Based on set(s)
of principles



Concepts
of balance &
trade-offs

Holistic mapping

Slows action to address
threats & benefits, obscures
opportunities for managers

CBD 2007 ICES 2020 Haugen et al 2023
Dickey-Collas et al 2022 Link & Haugen 2025



Implementation methods... where are levers?



Qualitative risk assessments

≈ screening, swift overview

*Advice to NEAFC
on next steps for
EAF ICES 2024*



Semi-quantitative risk assessments

structured & augmented, with triggers

*Other examples
exist*



Ecosystem status indicators

supplementing management with risk tables



Ecosystem-boundary adaptive management

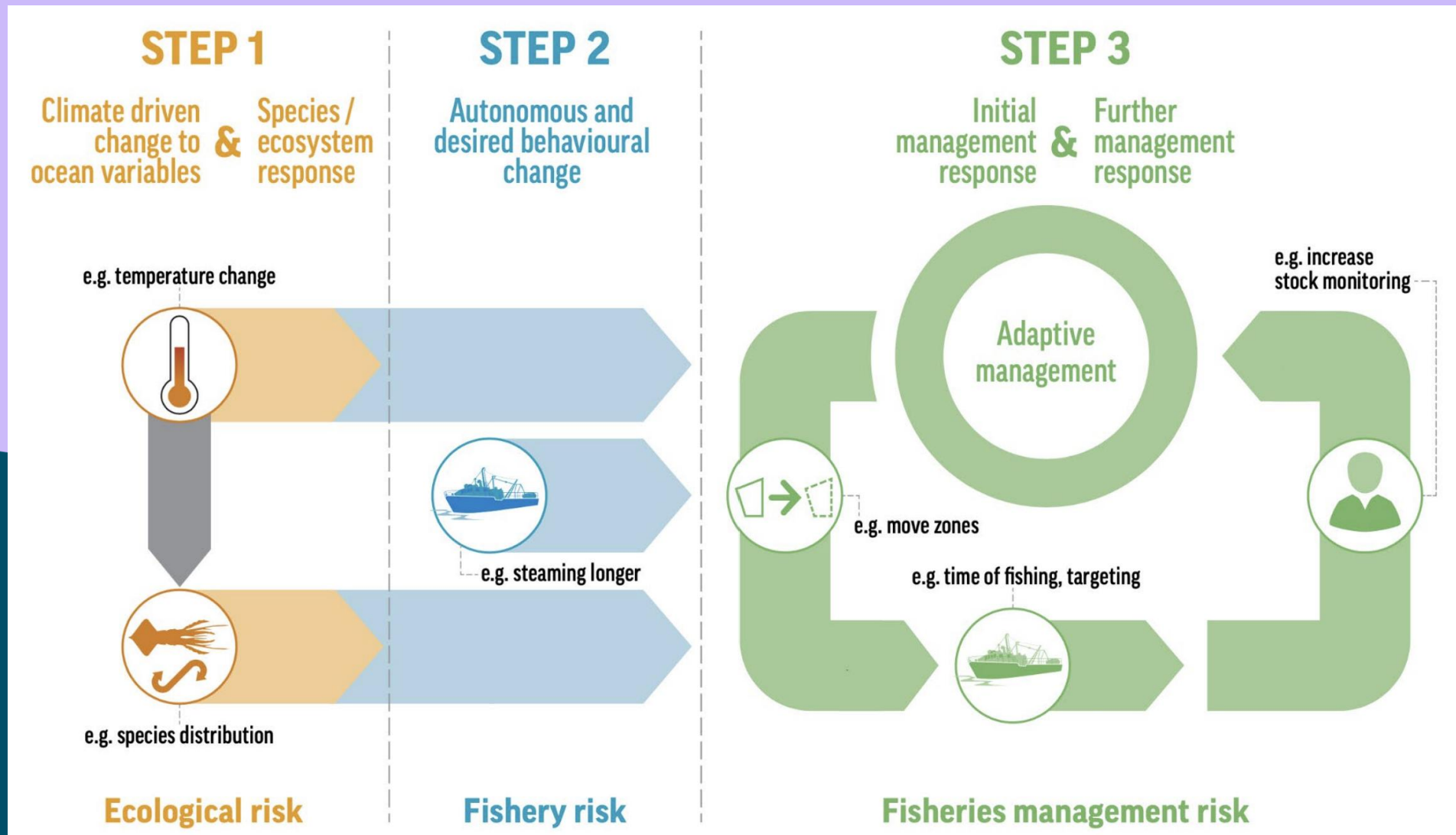
NAFO ecosystem roadmap



Empirical marine health audits

EU MSFD

Risk-based approaches - example





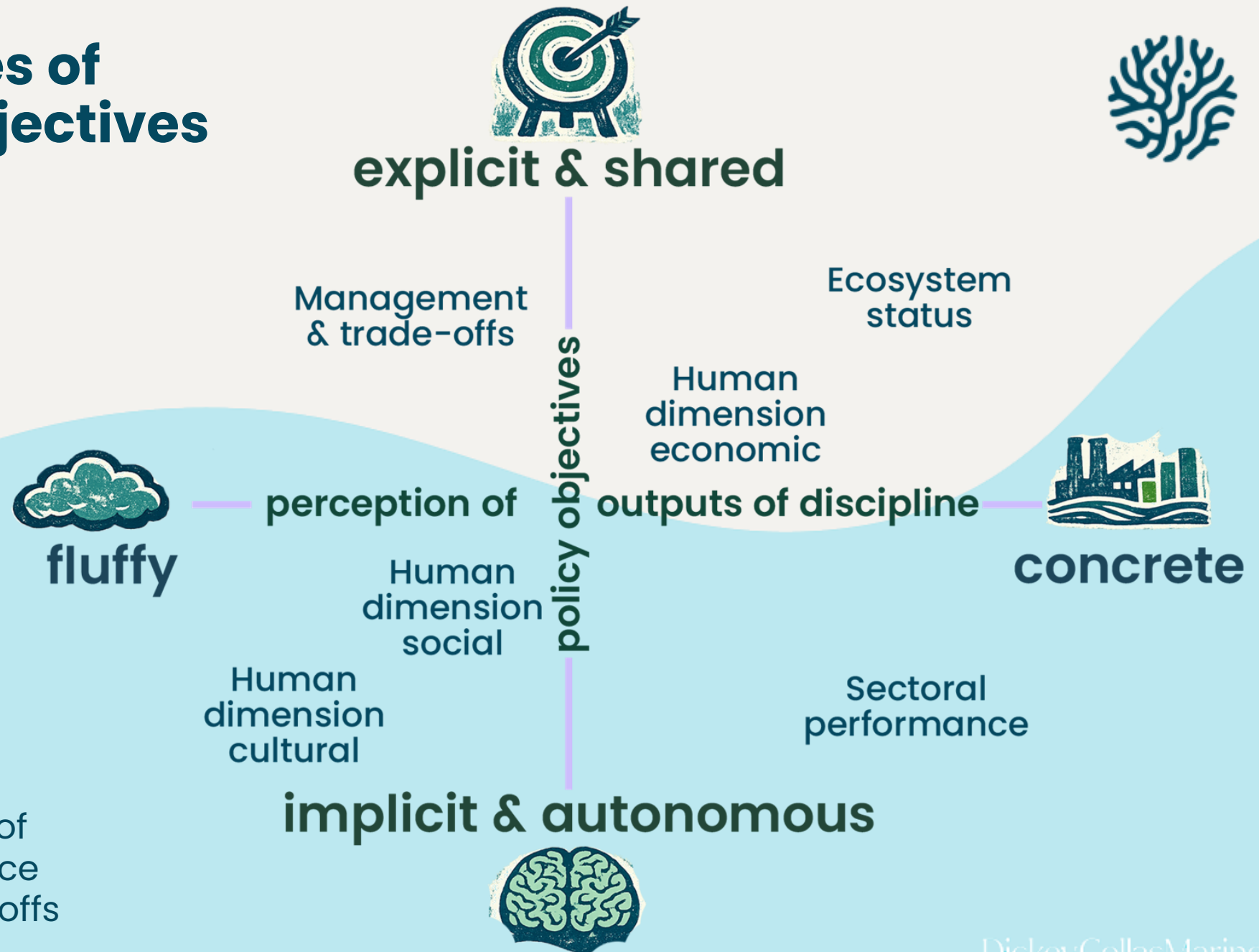
“Management objectives are easily prioritised”



Diverse properties of management objectives

Trade-offs won't be solved by evidence alone

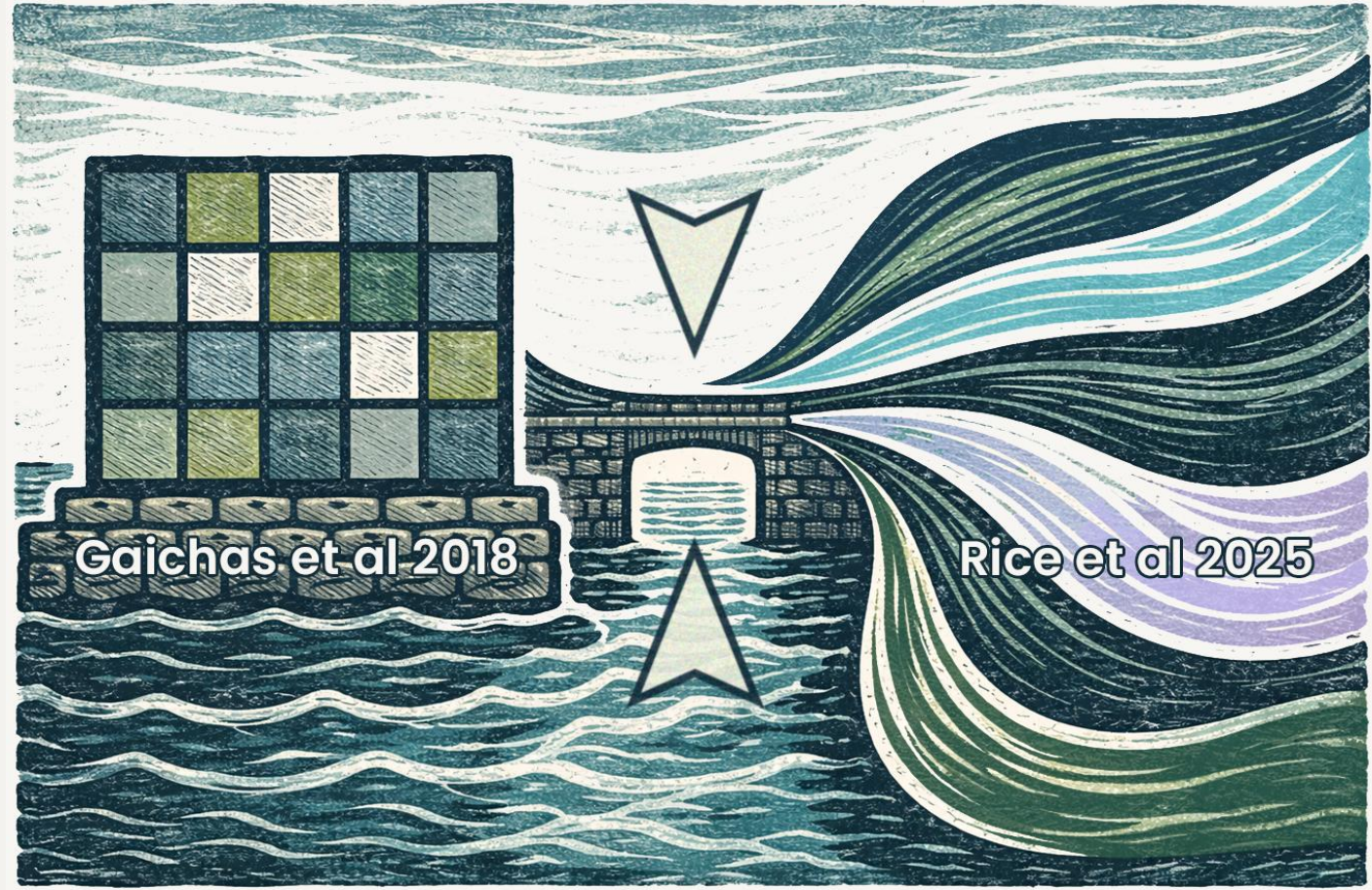
When values & perceptions of objectives differ, more science does not help deliver trade-offs



Linking risk, objectives, priorities & transactions



- management challenged by conflicting perspectives & adversarial roles
- integrate diverse values, knowledge systems, risk tolerances in consensus arena
- map ecological, economic, & social **outcomes** using stakeholders' **own** indicators & risk tolerances



**Risk equivalent
safe operating space**

Gaichas et al 2018
moving to Rice et al 2025



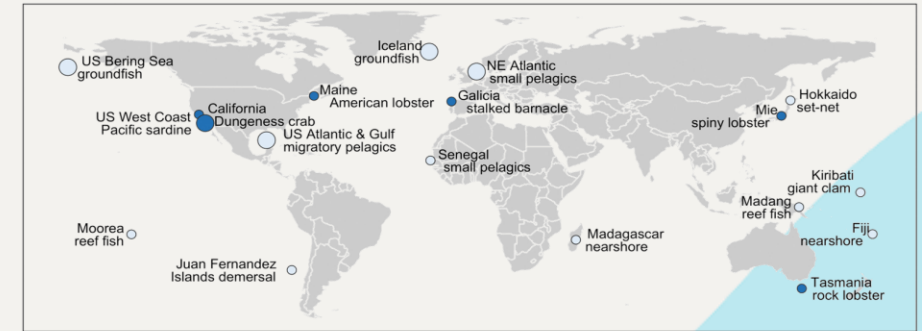
Recognise routes to similar objectives may differ



Objective: Climate resilient fisheries

Evidence of at least 2 routes:

1. Building ecological assets & strengthening communities e.g. rural & small-scale fisheries
2. Building economic assets & improving effective governance e.g. urban & wealthy fisheries



Eurich et al 2023 Climate resilient planning tool



Governance: EAF researchers require understanding

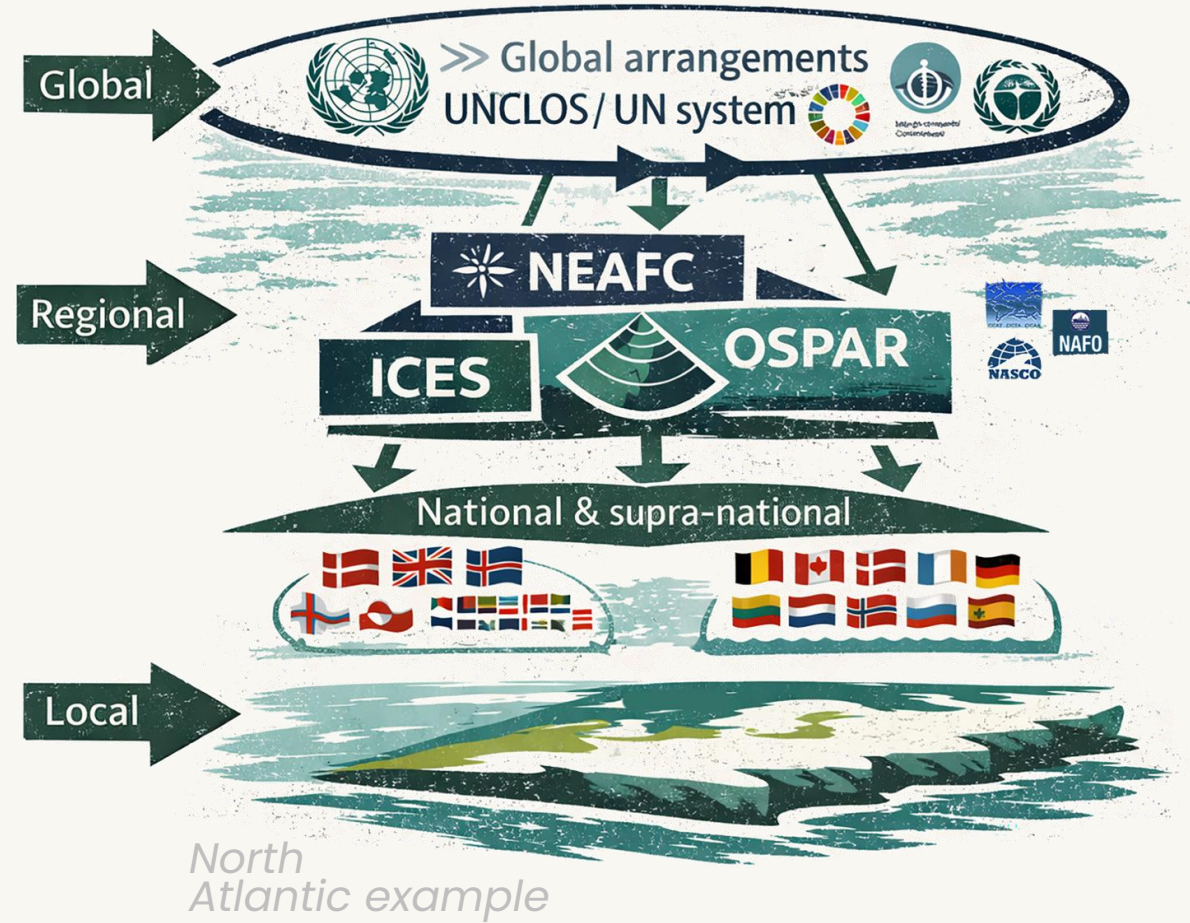


Researchers must engage with governance realities

naivety of institutional dynamics
impacts influence of evidence & practical integration

Government systems are layered & fragmented

ministries often compete internally & act without coordination in forums



North Atlantic example

Rudd et al 2018 Nygård et al 2020 Andrews et al 2025
Mahon & Fanning 2019 Fanning et al 2009



Do things differently:

As scientists, think about **process** as much as evidence:

- ability to achieve agreed outcomes ([FAO implementation tool](#))
- openness & transparency ([ICES guidelines](#))
- co-production ([Norström et al 2020](#), [Muhl et al 2023](#))
- built into cycles of learning ([Marshall et al 2017](#) [Levin et al 2018](#))



Practical implementation of science



1. Start from decision

- What choice does management need to make now?

2. Co-define objectives & acceptable risk

- Agree what success, failure, & caution mean across multiple perspectives.

3. Identify few pressures that matter most

- Do not map everything. Screen for the main drivers.

4. Use lean indicators linked to triggers

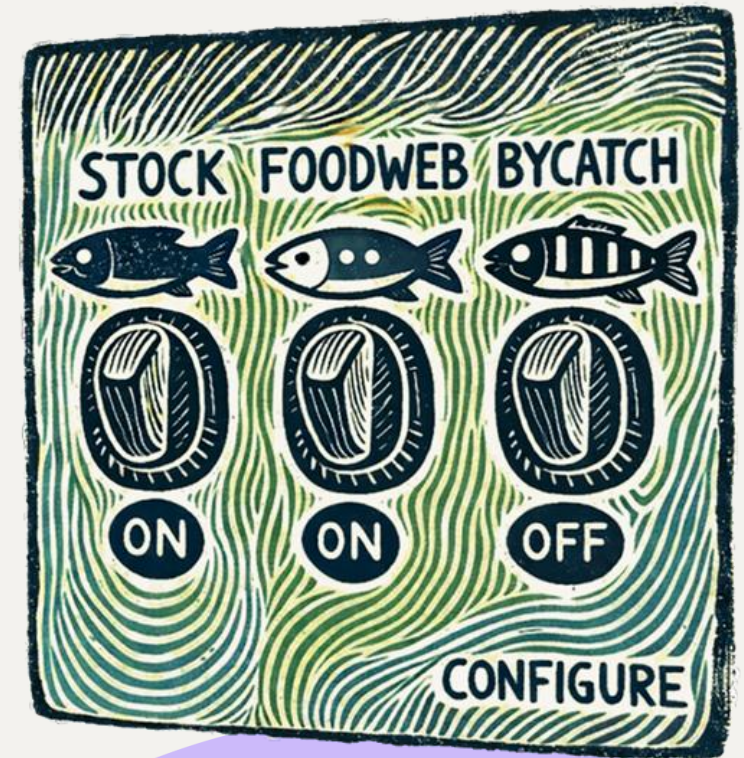
- Few indicators, each tied to management response.

5. Test measures under changing productivity

- Stress-test rules before they are used.

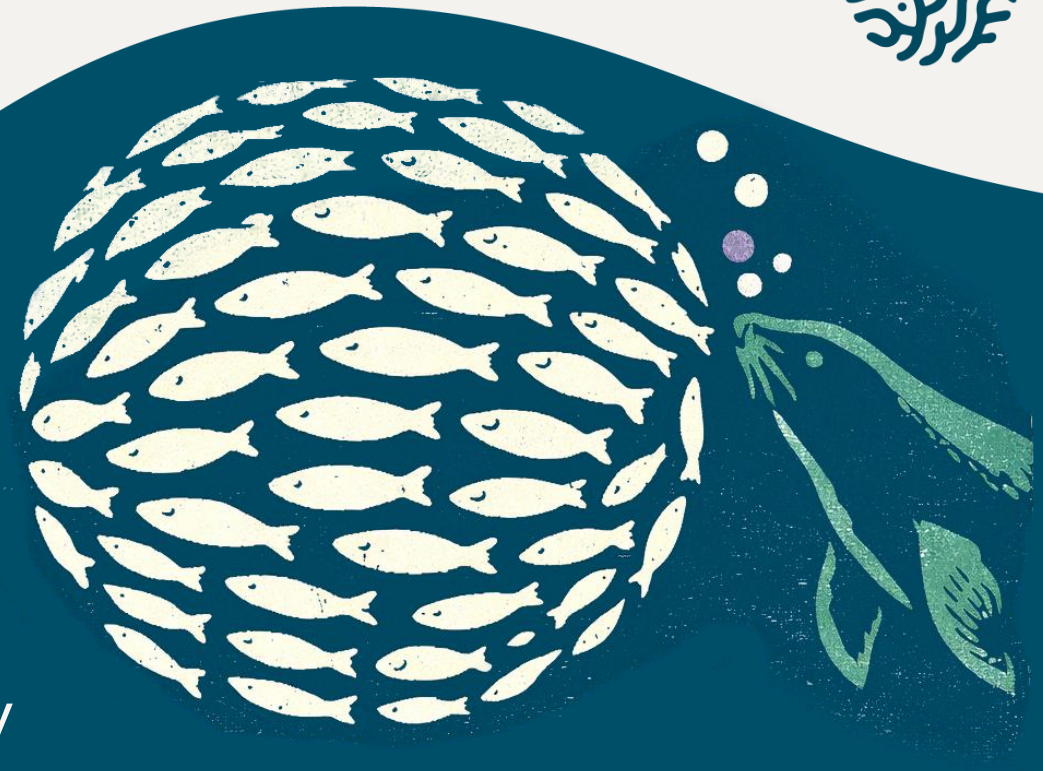
6. Show consequences, review, & adapt

- Be clear on trade-offs, monitor outcomes, update openly.



EAF/EBFM: principles are turned into practice through co-production, social science, & institutional change

EAF implementation not just about more science; it's about better alignment with values, power, governance, risk & uncertainty to reach 100% managed fisheries



1. Managers need actionable levers, not descriptions of system complexity
2. Priority: identify, test & communicate which pressures matter most & what happens when they are adjusted

Thanks



**DickeyCollas
Marine**

Science For Sustainable Sea & Ocean Management

Coming up in 2027



Global Symposium on Fisheries
Management in an Ecosystem Context

FIMEC

10-13 May 2027 | Penang, Malaysia

The logo illustration on the left depicts a cross-section of the ocean. At the top, a dark blue fishing vessel is shown on the surface. Below the surface, various marine life are illustrated in white and light blue: a shark, a squid, a jellyfish, a turtle, and several smaller fish. The seabed is shown with coral reefs and a squid-like creature. The entire scene is contained within a circular frame.

<https://meetings.pices.int/meetings/international/2027/fimec/>