

Social-ecological Systems and Ecosystem-based Marine Management

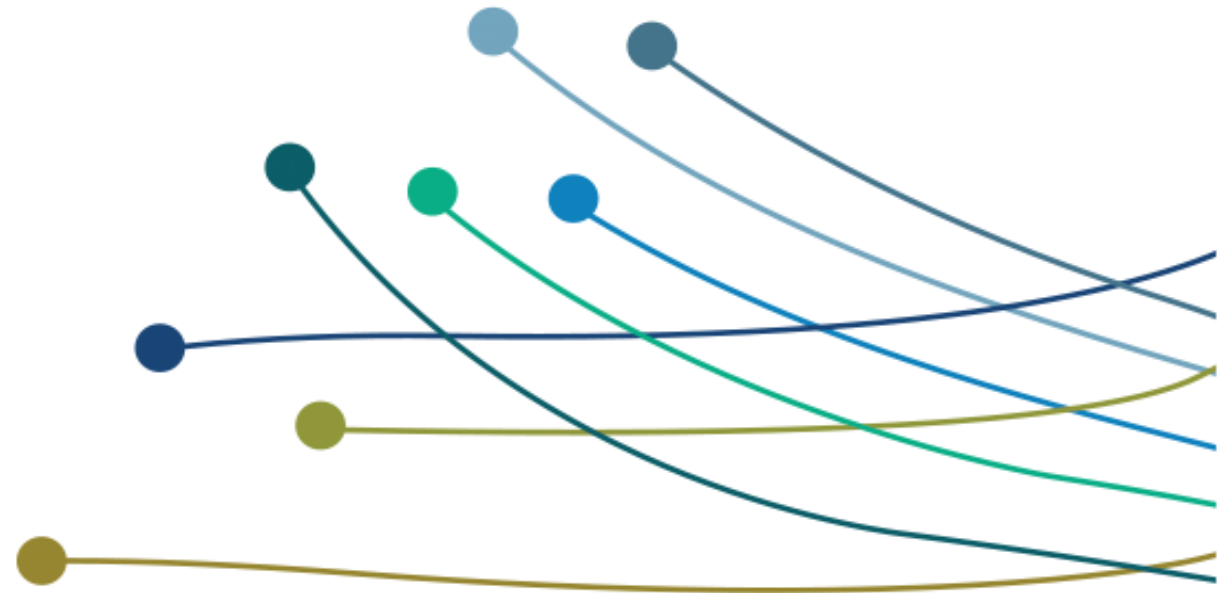


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With contributions from Mark Dickey-Collas, Marie-Julie Roux and many others!



Ecosystem Based Management

*Ecosystem-based management (EBM) is an approach to natural resource management that focuses on the **conservation and sustainable use of entire ecosystems**, rather than individual species or specific resources.*

*EBM takes into account the **complex interactions and interdependencies** between different species, habitats, and **human activities** within an ecosystem.*

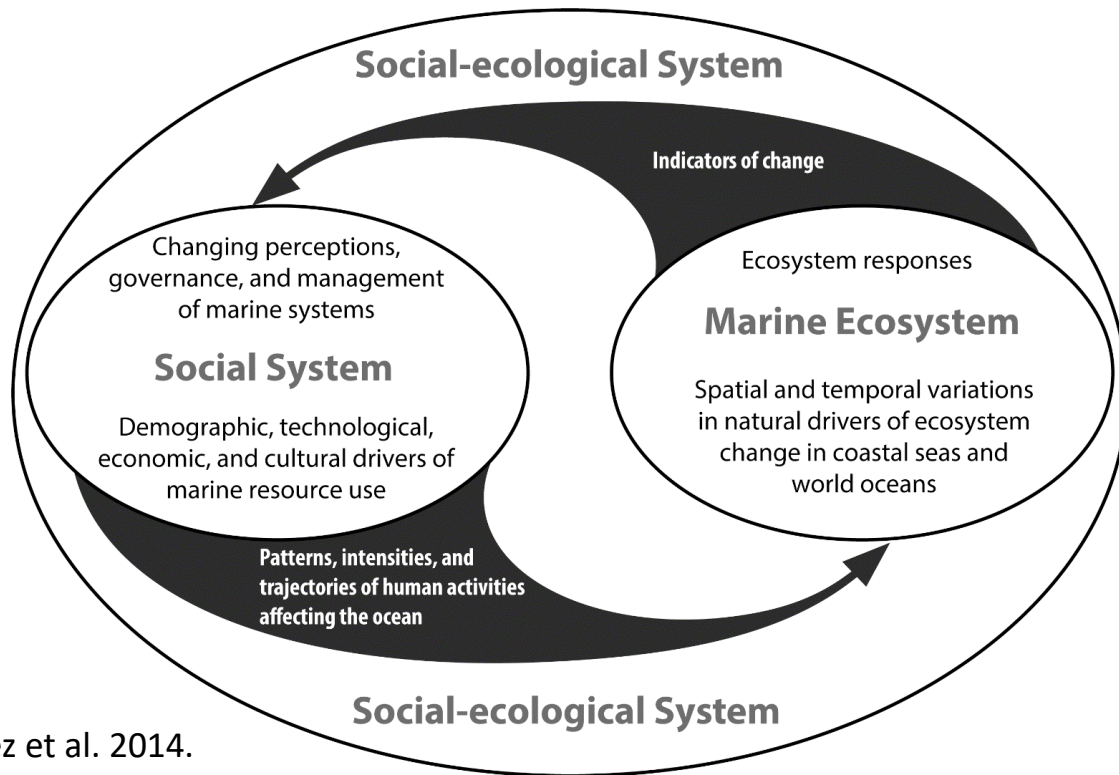
*The primary goal of ecosystem-based management is to maintain the **health, resilience, and functionality** of ecosystems while also **meeting the needs of society**.*

EBM mandate

- European Union (EU) Marine Strategy Framework Directive (MSFD)
- Australia's Oceans Policy
- Canadian Oceans Act
- Oceans Act of 2000
- Norwegian Cross Sector Management Plans
- South African National Water Act
- More....



EBM is a **WHOLE** systems approach...



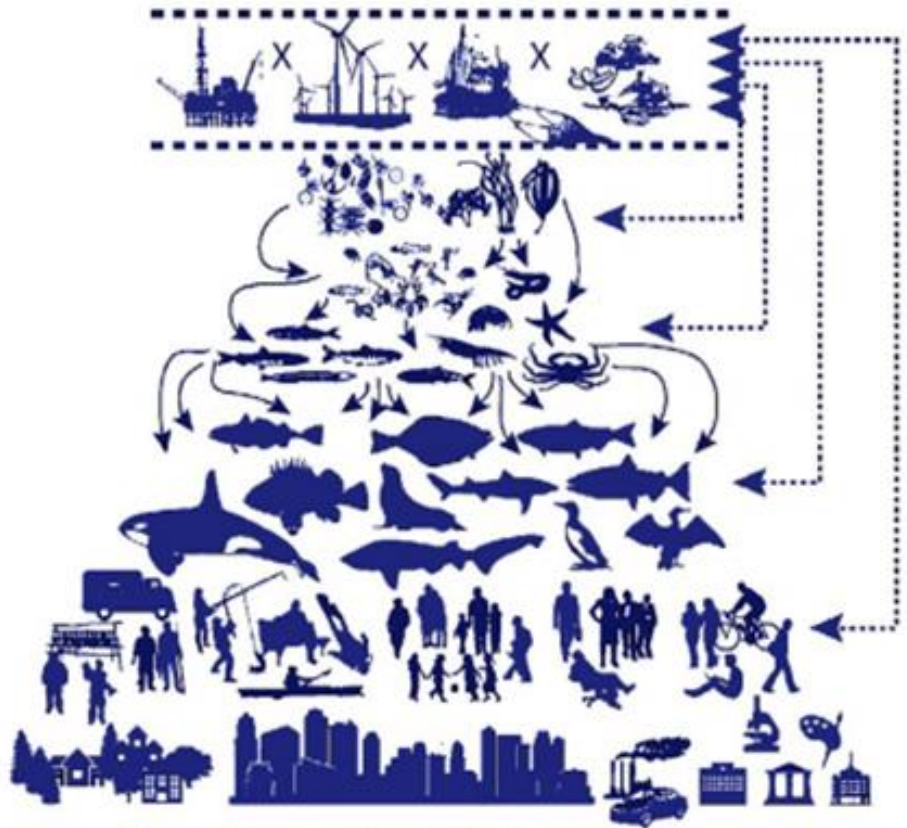
Máñez et al. 2014.



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We do not manage ecosystems or species,
we manage our actions that affect them

Activities, Pressures, Ecosystem
Components and Services,
Environmental Drivers, Social, Economic,
Governance, Policy, etc.



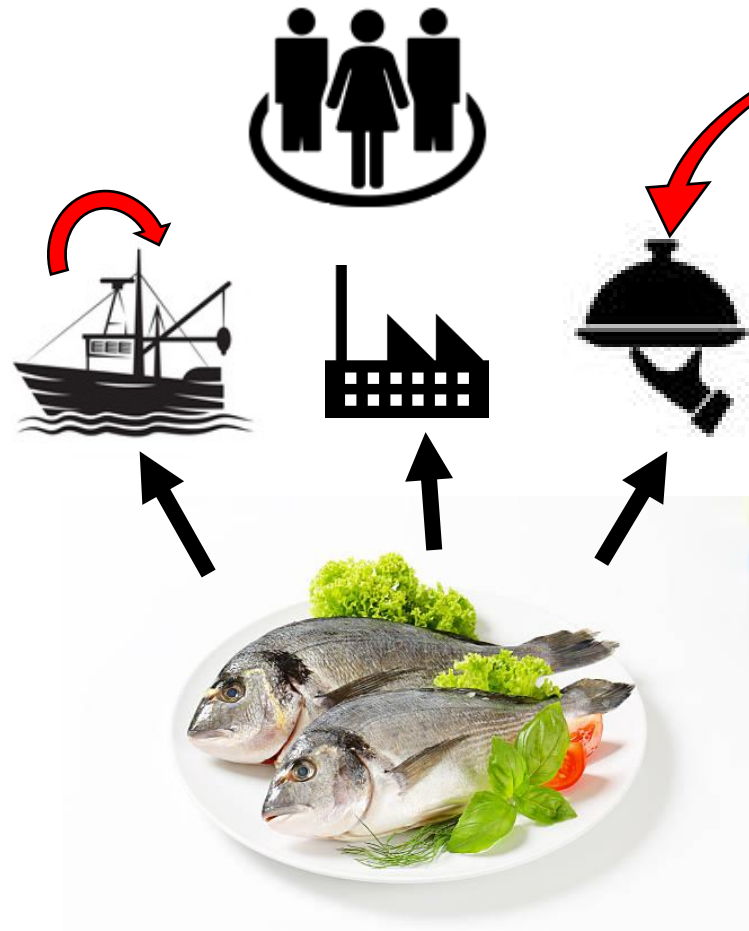
direct + indirect interactions

Can we really do this?



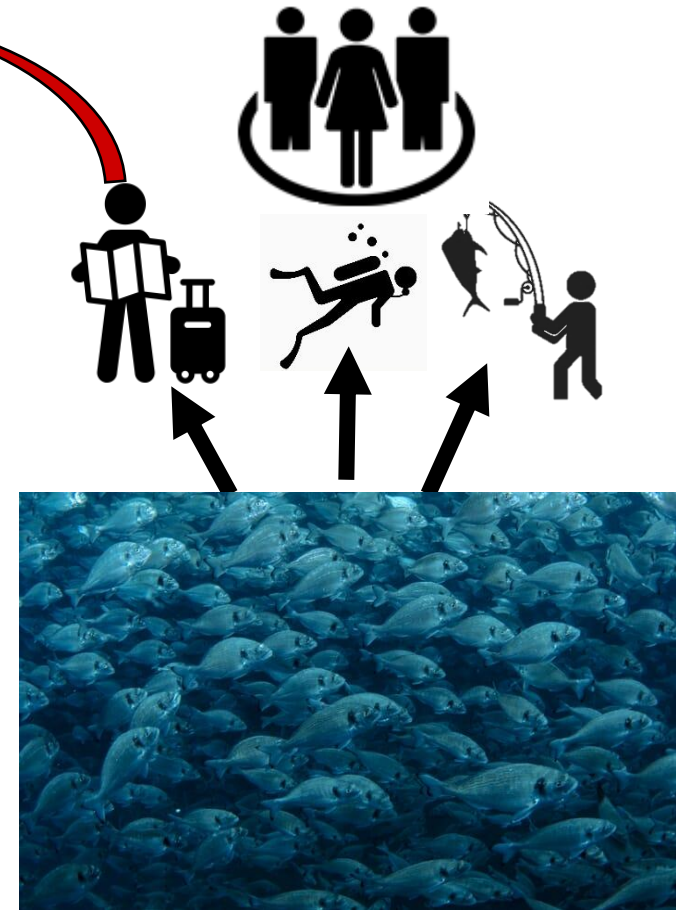
Why Complicate Things?

Blue Growth



Do we want more fish on our plates?

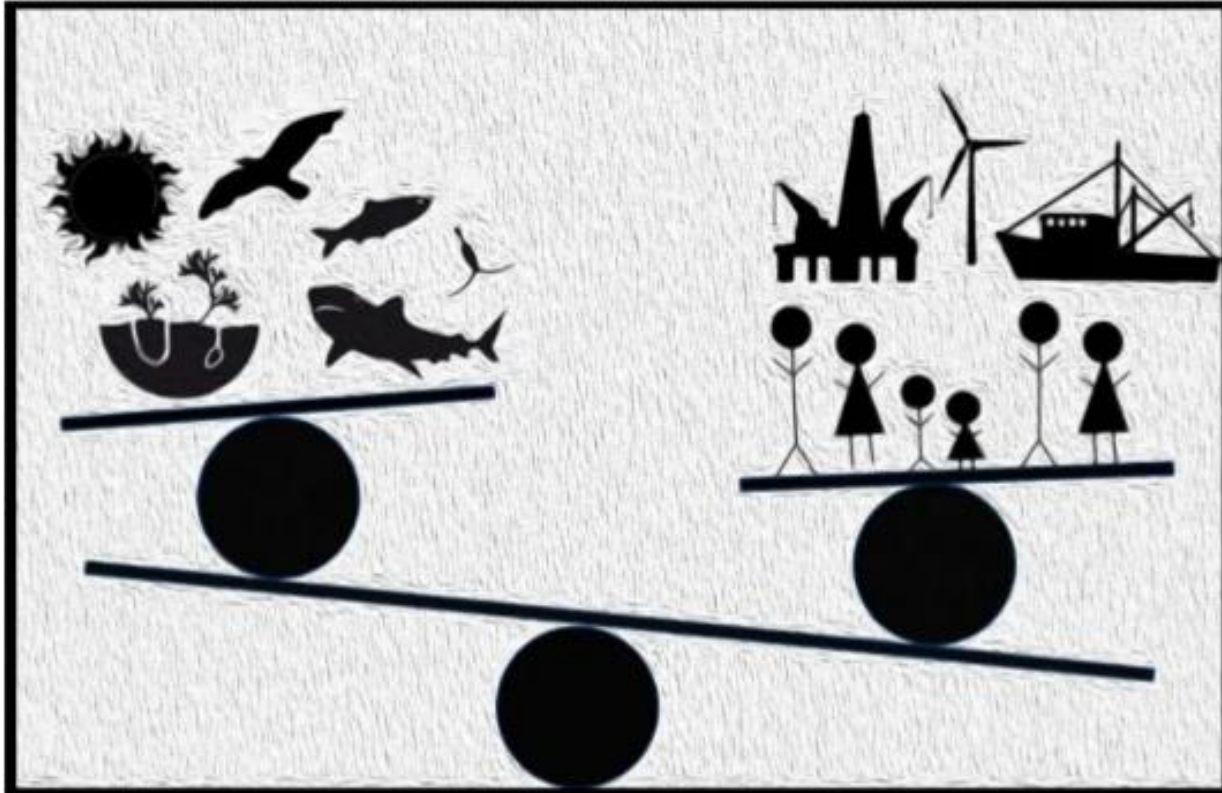
Marine Protection



Vs.

Or more fish in the sea?

Trade-Offs



Trade-offs arise when actions that benefit one aspect of a system (social or ecological) may harm or limit the other

Trade-offs indicate the presence of 'risk'

If we do not 'balance' correctly, we risk 'losing out'

**Trade-offs occur
whether you account
for them or not....**

Implementing Ecosystem-Based Management Globally

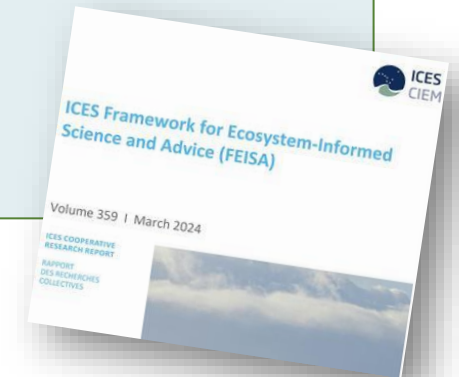


Core EBM principles

- Holistic Social-ecological Systems Approach
- Sustainable and Adaptive Management
- Use Scientific Knowledge
- Precautionary Approach
- Interdisciplinarity
- Stakeholder Involvement

ICES Framework for Ecosystem-Informed Science and Advice

- Knowledge plurality
- Operational objectives
- Scenario-based approach
- Risk assessment and evaluation
- Risk communication

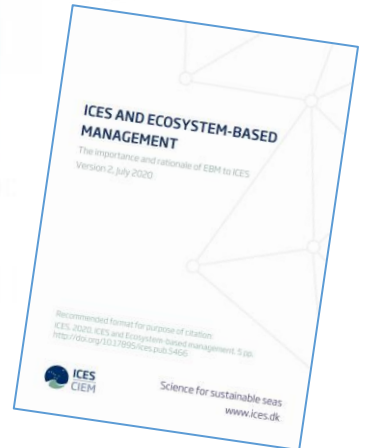
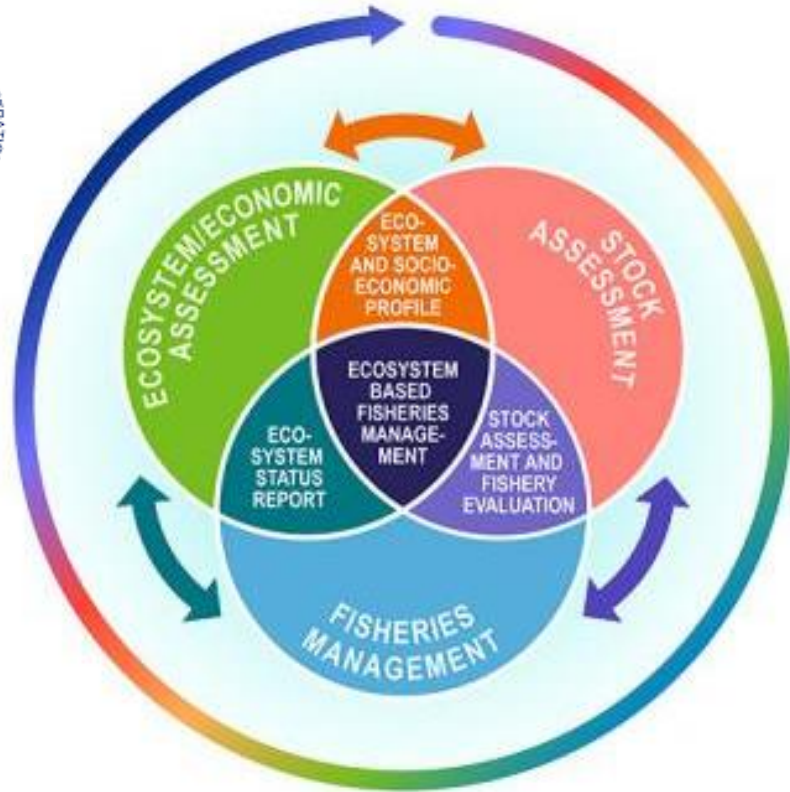


THEORY



PRACTICE

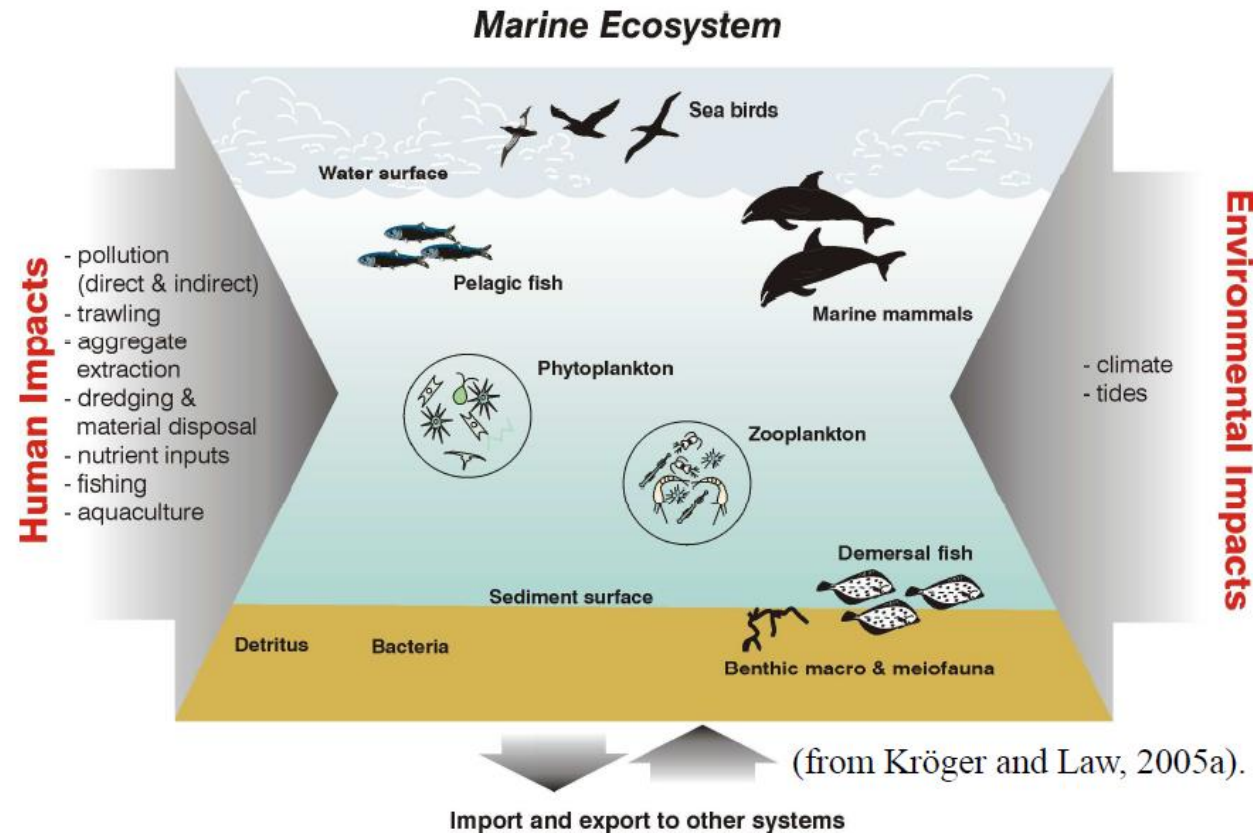
We have the processes



We have the tools

Integrated Ecosystem Assessment (IEA) examples

- Risk Assessment
- Scoping with stakeholders
- Conceptual Modelling
- Identifying emerging issues
- Scenario Identification
- Socio-economic indicators
- Trade-off identification



- Integrated Trend analysis
- Early warning signals
- Breakpoint analysis
- Indicators and Thresholds
- Identification of drivers
- Etc.

A range of physical, chemical and biological statistical and mechanistic models

We have

Common understanding and principles

Many tools, approaches, mechanisms

Integrative methods

Excellent people

Increasing monitoring and data

Expanding computing power

Clear mandate for EBM

Urgency!

We need....

- Clear operational objectives
- Better recognition of the importance of social –ecological systems and trade-offs
- More social, political, governance, economic specialists
- Multi- and inter-disciplinary teams working integratively to produce transdisciplinary outputs
- Dedicated funding to support routine production of EBM science and advice

Objectives

CLEAR, STATED and MEASUREABLE OPERATIONAL OBJECTIVES

When objectives are unclear, unspecified, implied but not explicitly stated, or conflicting, it is much more difficult to provide clear and concrete advice.

Objectives allow us to focus on an outcome, an end goal

- What do we want to achieve?
- What will we willing to tolerate?

Clear objectives enable clear outputs (clear advice)

Operational objectives enable the identification of trade-offs



e.g. precautionary principle, MSY, limit reference values, specific requests, etc.



Where to from here....

- Clear mandate for EBM
- Increasing demands for EBM/ ecosystem-informed science and advice
- More explicit EBM *operational* objectives
- Project-based funding limits applicability, and adaptability (EU)
- REQUIRES STRATEGIC INVESTMENT THAT CAN:
 - Support dedicated multi-disciplinary assessment teams
 - Facilitate meaningful stakeholder engagement
 - Provide routine EBM advice



The benefits, for society and the ecosystem, will far outweigh the costs...



A word cloud featuring the phrase "thank you" in numerous languages and colors. The central and largest text is "thank you" in red. Other prominent words include "danke" (blue), "gracias" (green), "merci" (orange), "dziękuję" (pink), "obrigado" (green), "sukriya" (purple), "arigatō" (pink), "terima kasih" (yellow), "mochchakkeram" (blue), "go raibh maith agat" (purple), "dank je" (green), "teşekkür ederim" (pink), "ngiyabonga" (red), "tapadh leat" (orange), "bedankt" (yellow), "mauruuru" (blue), "hvala" (green), "sagolun" (blue), "sukriya" (purple), "kop khun krap" (green), "taiku" (blue), "arigatō" (pink), "takk" (green), "dakujem" (orange), "merci" (orange), "obrigado" (green), "dziękuję" (pink), "sukriya" (purple), "arigatō" (pink), "takk" (green), "dakujem" (orange), "merci" (orange), "obrigado" (green), "dziękuję" (pink), "sukriya" (purple), "arigatō" (pink), "takk" (green), "dakujem" (orange), "merci" (orange).