

Marine natural capital and sustainable marine management

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Marine Natural Capital & Ecosystem Services

Natural Capital
Our environmental assets: the ocean, land, freshwater, air, the species and habitats they contain... .. the processes and functions that occur within them.

STOCKS

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FLOWS

Ecosystem Services
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Provisioning: Food, raw materials, energy

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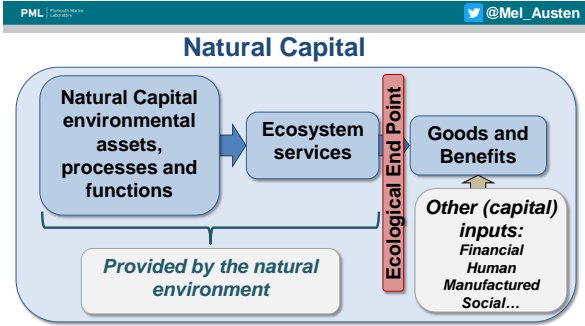
Ecosystem services
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Provisioning: Food, raw materials, energy
Regulating: Protection from harm and extreme events (e.g. climate regulation, flood protection, waste removal)
Cultural: The way environmental interaction shapes our experiences (e.g. recreation, inspiration, heritage)

Natural Capital

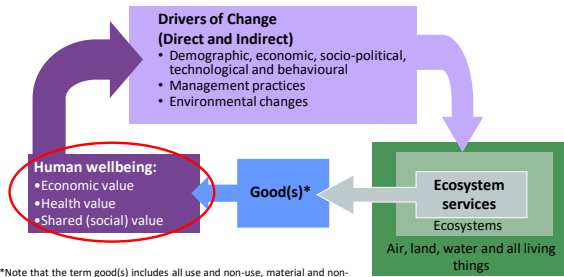
Natural Capital environmental assets, processes and functions → **Ecosystem services** → **Goods and Benefits**

e.g. seafood, recreation, tourism, renewable energy, flood defences, climate regulation etc.

Provided by the natural environment



National Ecosystem Assessment Conceptual Framework



*Note that the term good(s) includes all use and non-use, material and non-material benefits from ecosystems that have value for people.

Why this approach is important

- Need to design local and national policies and management strategies:
- To preserve marine and coastal resources in a context of continuous environmental pressures, including global climate change.
 - For sustainable growth in economic and social wellbeing

Assessment of trade-offs in different uses (and protection) of marine and coastal environments through ecosystem service assessment and valuation of benefits...

.... can help to increase efficiency of coastal and marine decision-making processes

And **make trade-offs more apparent**

Context - external

What do we want from estuaries, coasts and oceans now, and in the future?

- Food security
- Energy security
- Transport security
- Tourism, leisure, recreation,
- Environmental sustainability
- Good environmental management
- Understanding of risk
- Mitigation options

Blue Growth

Usage/Application of ecosystem service approach in policy and management?

- ✓ UK Natural Environment White Paper
- ✓ EU Biodiversity Strategy
- EU Marine Strategy Framework Directive
- X EU Common Fisheries Policy
- ✓ North Devon Biosphere Reserve Management Plan
- Tamar Estuary Management Plan
- X Marine Planning
- X Marine Licencing
- X EIA
- X SEA

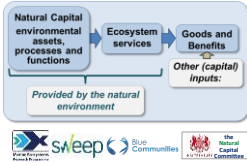
Natural Capital: Can it be operationalised for the marine environment?

YES Marine is accustomed to systems thinking rather than species orientated approaches
 We have considerable data and modelling tools available
 We have legislation in place that would benefit from natural capital approaches

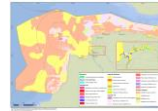
But We need to give it a go to find out!
 This will need resourcing ... and possibly a change of mindset
 We need to accept that it won't (initially) be perfect

We will learn by doing

Apply at large and small scales (e.g. Marine Pioneer)
 ££ Valuation isn't always necessary for natural capital approach to support decisions
 Identify key data and tools gaps, and fill them
 We work better in collaboration
PRACTICE MAKES PERFECT



Testing the framework and developing tools for the application of the Natural Capital Approach in the North Devon Marine Pioneer

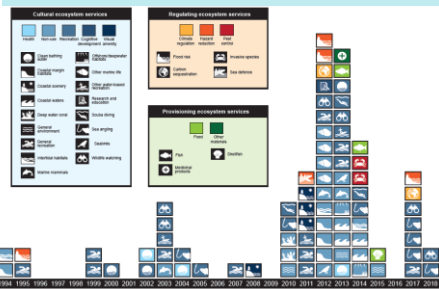


- A natural capital asset register
 - extent and condition of the natural capital assets
 - stocks and flows of ecosystem services
- A risk register to identify threats to natural capital
- Recommendations on key natural capital assets on which future management opportunities could be focussed to achieve the greatest gains
- Incorporating the natural capital approach into sustainability appraisal

Rees, S.E., Ashley, M., Cameron, A., 2018. North Devon Marine Pioneer Report 2: A Natural Capital Asset and Risk Register A SWEEP/WWF-UK report by research staff the Marine Institute at Plymouth University

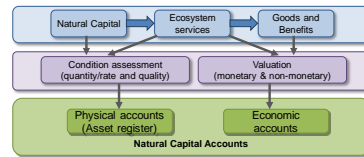
Defra report
 Hooper, T., Ashley, M., Bürger, T., Langmead, O., Marcone, O., Rees, S., Rendon, O., Beaumont, N., Atrill, M. and Austen, M. 2019. Application of the natural capital approach to the marine environment to aid decision-making. Phase 1 Final Report. (project code MES115). (available online)

Evolving non-market monetary valuation of UK's coastal and marine Environment

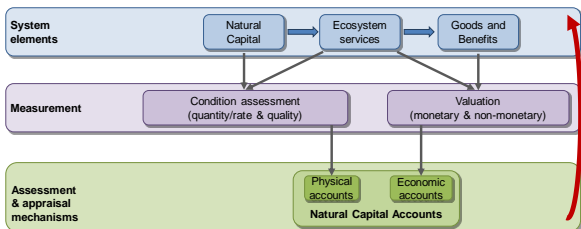


Natural Capital Accounts

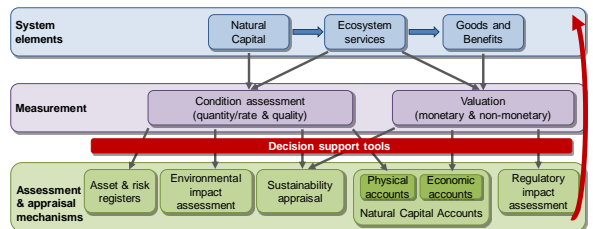
"Enabling organisations to gather **natural capital information** in a **coherent and comparable format** will help both **companies** and **policy-makers** to make **better informed decisions** about the **management of natural capital assets**."



Using the Approach in Decision Support

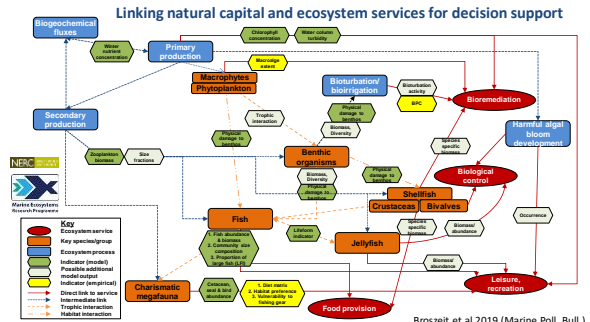
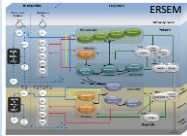


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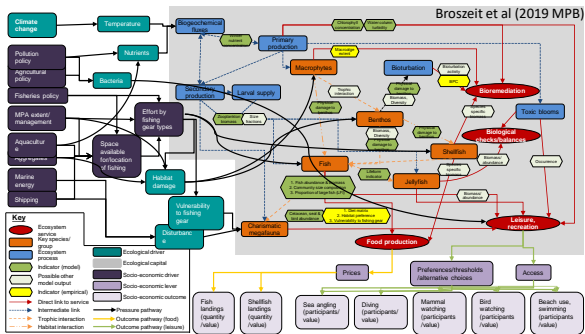




- Marine (vs terrestrial) is accustomed to systems thinking rather than species orientated approaches
- We have considerable data and modelling tools available



Broszeit et al 2019 (Marine Poll. Bull.)



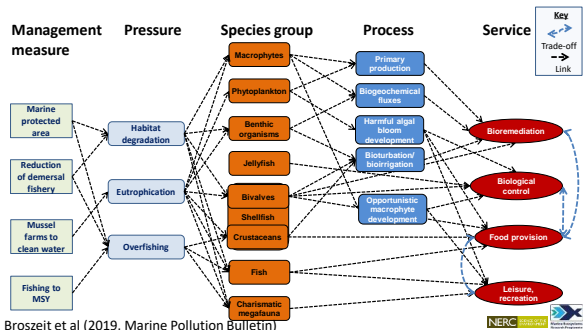
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Linking natural capital and ecosystem services for decision support

Conceptual models identify key links between natural capital assets and ecosystem services

Links to Ecological drivers; Management measures; Economic impacts

But to simplify things we can pull out the key links and still examine trade-offs under different options ...



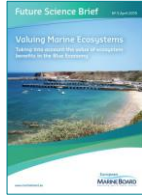
Broszeit et al (2019, Marine Pollution Bulletin)

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Some Recommendations to UK Government from Natural Capital Committee's recent Marine paper

- Formally incorporate natural capital thinking into decision making
- Apply Net environmental gain to all development and activities in the marine environment.
- Recover and improve marine natural capital in the seabed, (address fishing activity and dredge spoil dumping at sea)
- Review and re-orientate Marine protected areas towards protecting natural capital assets and flows of ecosystem services, including recovery and resilience.
- Implement Fisheries management as a component part of wider natural capital,

European Marine Board Future Science Brief 5
 Working Group on Valuing Marine Ecosystems (WG VALMARE)
 Melanie C. Austen (Chair), Peder Andersen, Claire Armstrong, Ralf Döring, Stephen Hynes, Harald Level, Soile Oinonen, Adriana Ressurreição, Joke Coopman



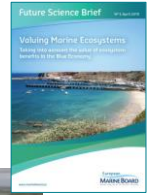
Highlights current thinking in ecosystem benefits valuation for the marine environment

- Can incorporate outputs from valuation studies into:
- Traditional analyses used in resource and environmental economics
 - European marine policy landscape and related management and decision making choices.



Valuation of ecosystem services and benefits can support:

- Long-term sustainable Blue Growth Strategy
- EU policies
- Commercial/Regulation/Management
 - licencing
 - planning for conflicting uses
- Environment
 - environmental protection
- Raise awareness of importance of the marine environment to society and in the economy



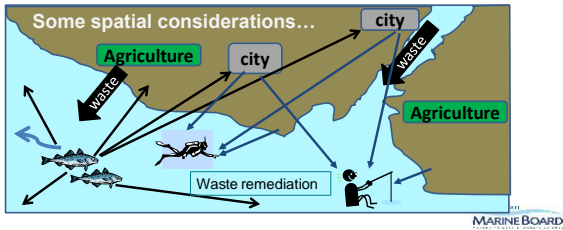
- EU Maritime Policy*
- Common Fisheries Policy*
- EU Marine Strategy Framework Directive*
- Marine Planning Directive*
- Biodiversity Strategy*
- Invasive Alien Species Strategy*
- IMO Convention on Ballast Water Management*



Recommendations

Set the right scale and boundaries for each valuation study

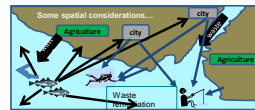
- Those areas that provide the services and those where the benefits occur



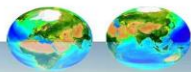
Recommendations

Set the right scale and boundaries for each valuation study

- Those areas that provide the services and those where the benefits occur
- Administrative boundaries
- Cooperation on local, regional and international scale might be necessary to make a robust assessment and undertake trade-off analysis



Thank you



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