CF2020 3 Minute Presentations

Session 5 January 16th

A system for making asset registers for UK habitats below mean high water

Marine Natural Capital team

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Marine Asset Register System

Why?

- Provide **accessible evidence of the value** of marine assets and linking them to benefits received

- Help businesses, managers and regulators consider **what and where the assets are** that are supporting a benefit and what the current and future risks are

- Produce evidence that can provide the **basis for physical Natural Capital Accounts**

- Produce **updateable customer specific Asset Registers** that contain information suitable to inform local operational decisions up to national level reporting

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How does it work?

- **Asset classification process** using NC relevant attributes

- Process **linking benefits received to assets**

- Asset and Flow **condition determined using available advice** on habitat condition and magnitude of service flow

- **Ecosystem Service vulnerability assessment** to indicate risk to asset / reduced service flow

- Asset aggregation process to produce **customer specific Asset Registers**

- **Underpinned by updateable** JNCC Marine Natural Capital **evidence products**
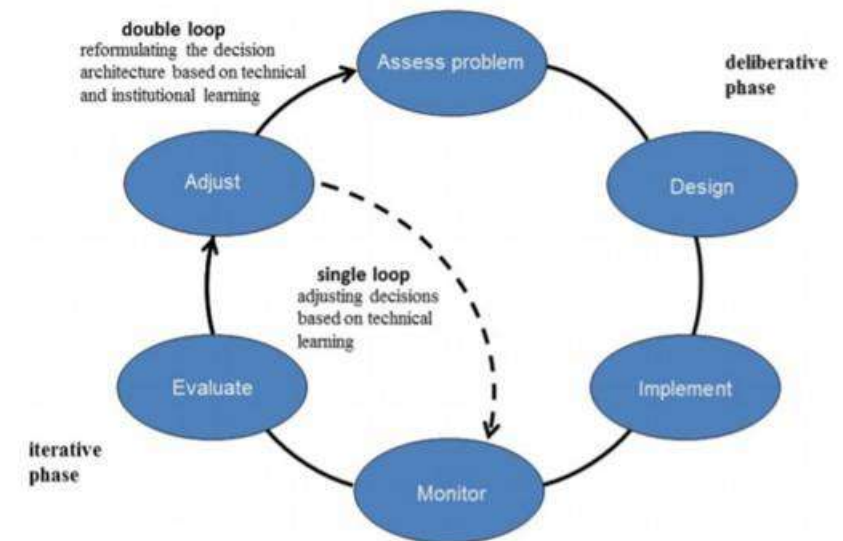
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Problem:

- **Uncertainty** around impacts of fishing on sedimentary habitats in offshore environments **reduces confidence** in the evidence base available on which to make management decisions.
- Challenges remain around new and innovative ways of **engaging stakeholders** in management decision making.
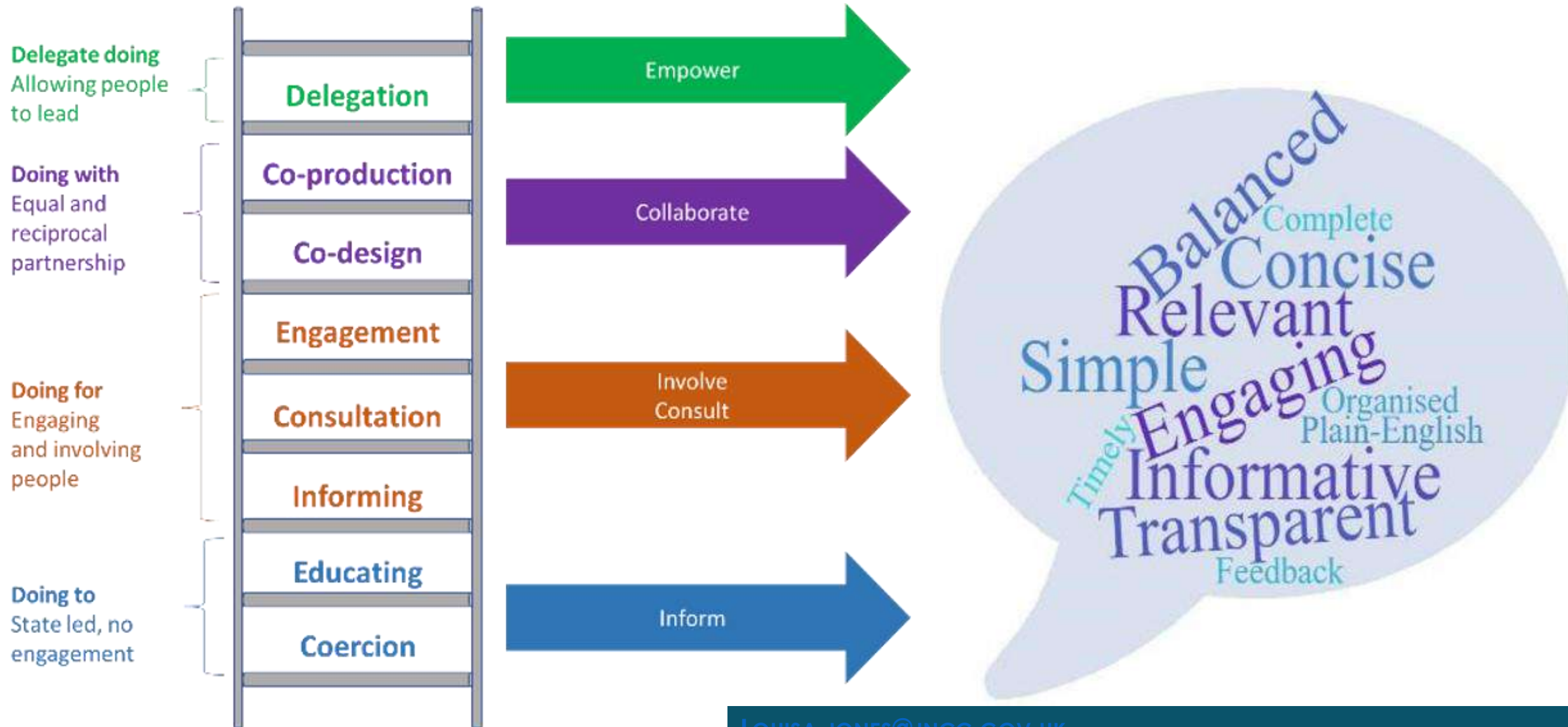
Our solution:

- Using the **Adaptive Management Cycle** as a means to adapt management to emerging evidence and facilitate a participatory approach increasing stakeholder involvement in decision making
- Involving key stakeholders and building **stakeholder stewardship**

Adaptive Management Cycle

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Benthic Impacts Tool

Before

NNSS SAC
RBS
1 (100% remain)
0.8 (80% remain)
0.6 (60% remain)
0.4 (40% remain)
0.2 (20% remain)

Annex I Reef (confidence)
Potential
High

N
10 5 0 10 Kilometers

After

NNSS SAC
RBS
1 (100% remain)
0.8 (80% remain)
0.6 (60% remain)
0.4 (40% remain)
0.2 (20% remain)

Annex I Reef (confidence)
Potential
High

N
10 5 0 10 Kilometers

Closed area

Before – After

NNSS SAC
Change in RBS
+ Positive change
0 No change
- Negative Change

Annex I Reef (confidence)
Potential
High

N
10 5 0 10 Kilometers

Driving purpose

Stakeholder engagement

Decision making

Developing a participatory approach to the management of fishing activity in offshore MPAs

Data & Evidence

Roles and responsibilities

Participation principles

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Developing the evidence-base to support climate-smart decision making on MPAs
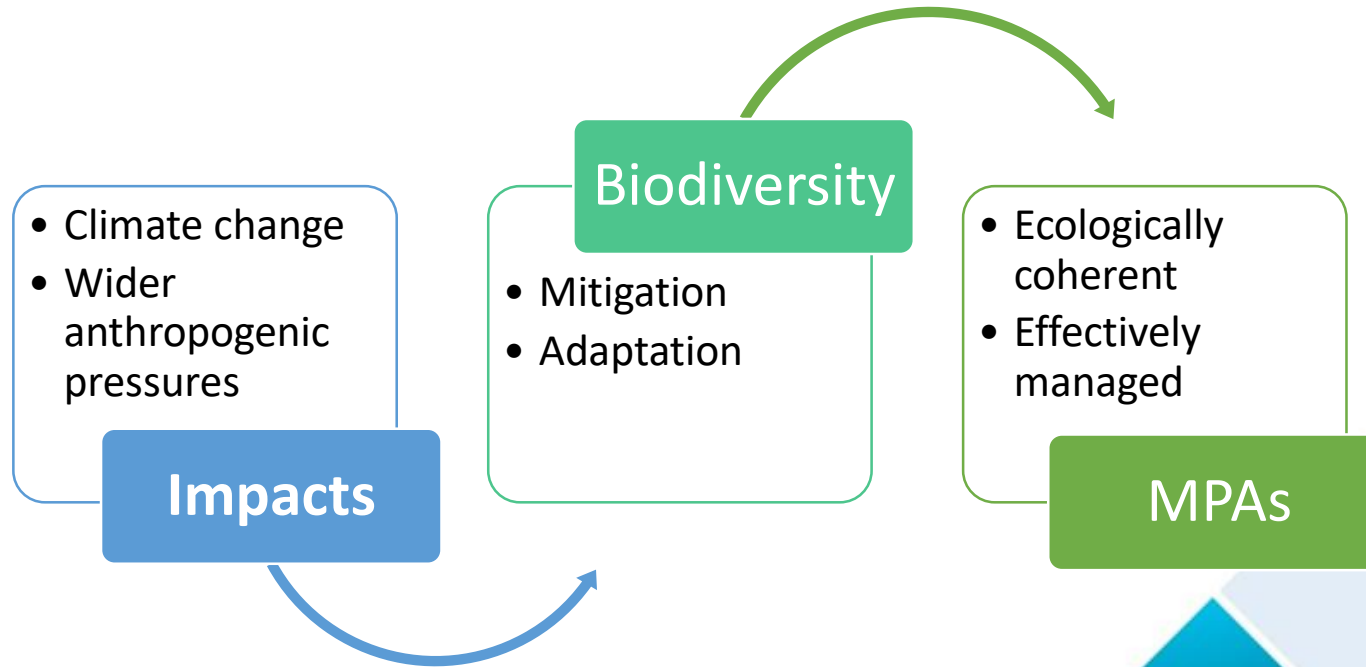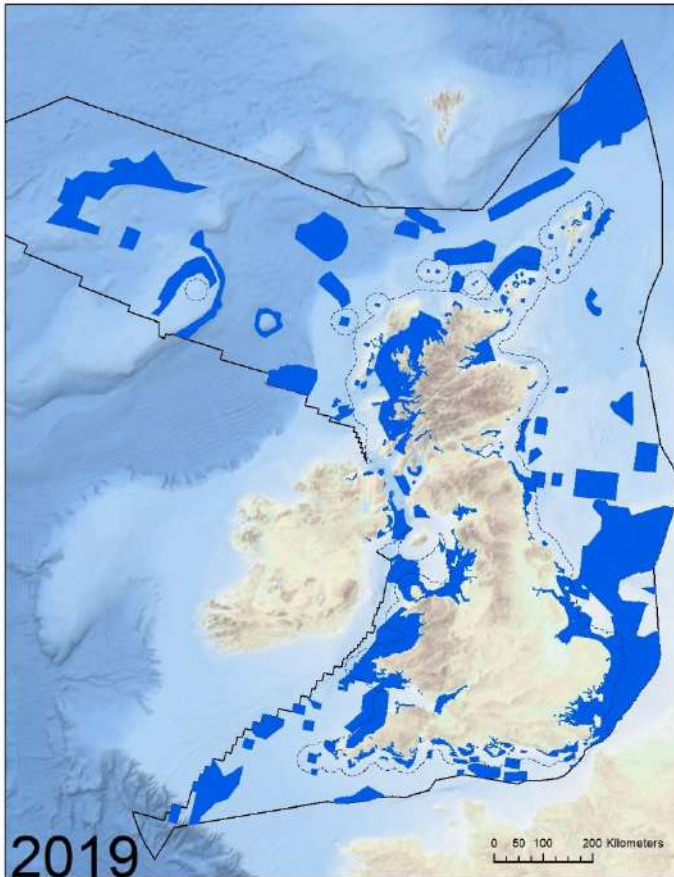
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www.linkedin.com/company/jncc

- Climate change
- Wider anthropogenic pressures

Impacts

Biodiversity

- Mitigation
- Adaptation

- Ecologically coherent
- Effectively managed

MPAs

2019

©JNCC 2019. UK Territorial Sea Limit. UK Continental Shelf (Designation of Area) Order 2014. Contains UKHO data © Crown copyright. Contains EMODnet Digital Bathymetry (DTM) from EMODnet Bathymetry Consortium (2016). Contains JNCC, natural England , Scottish Natural Heritage, DAERA & Natural Resources Wales data © Copyright and database right 2019. Map and statistics include SACs, SPAs, MCZs and NCMPAs only.

Department for Environment Food & Rural Affairs

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'Climate-smart' MPAs:

355 UK MPAs

42% protect habitats that provide **nature-based solutions** to the **pressures associated with climate change**

35% protect habitats which play a key role in **coastal protection** against the projected **increases in storm surge events** and **sea-level rise** associated with **climate change**

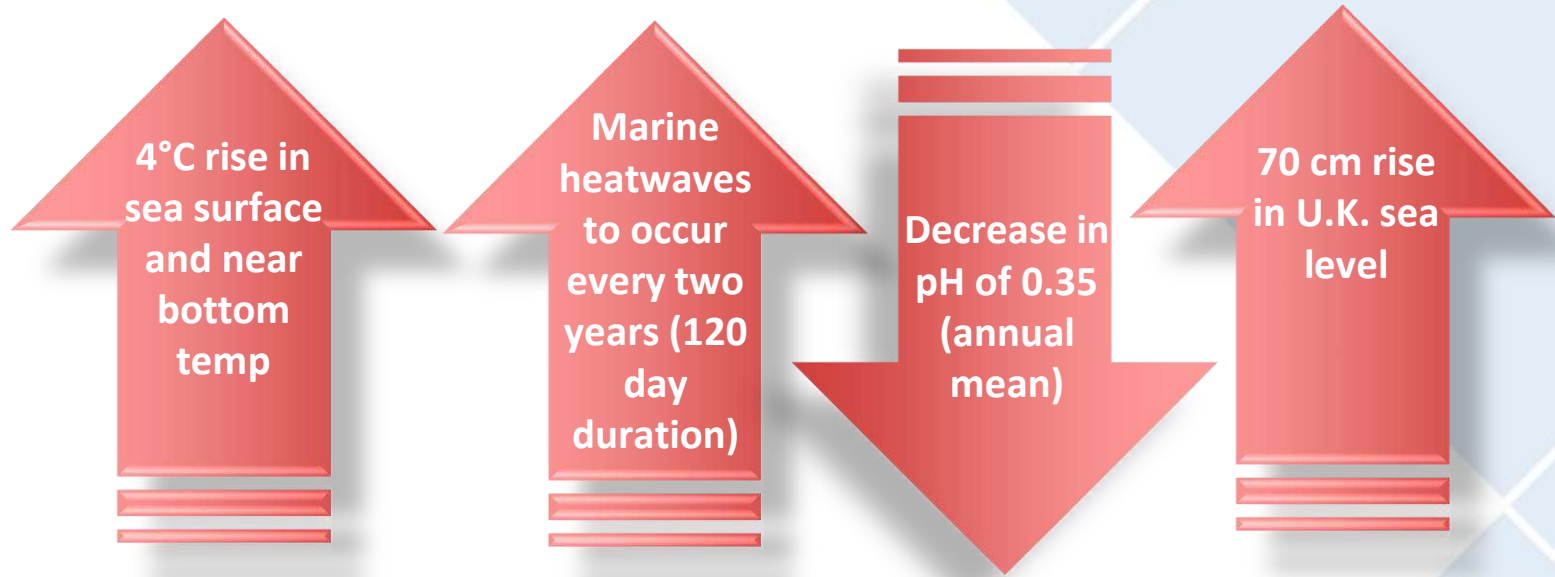**29%** protect habitats which contribute to **atmospheric carbon sequestration**

18% protect **seagrass beds, kelp beds** and/or **saltmarsh**; known to be some of the planet's **most efficient ecosystems** in **sequestering atmospheric carbon**

JNCC Nature-based solutions to climate change

Benchmark pressures under the high emission scenario by the end of the century (2081-2100):

4°C rise in sea surface and near bottom temp

Marine heatwaves to occur every two years (120 day duration)

Decrease in pH of 0.35 (annual mean)

70 cm rise in U.K. sea level

The Canyons

- Sea-pen and burrowing megafauna communities
- Cold-water coral reefs
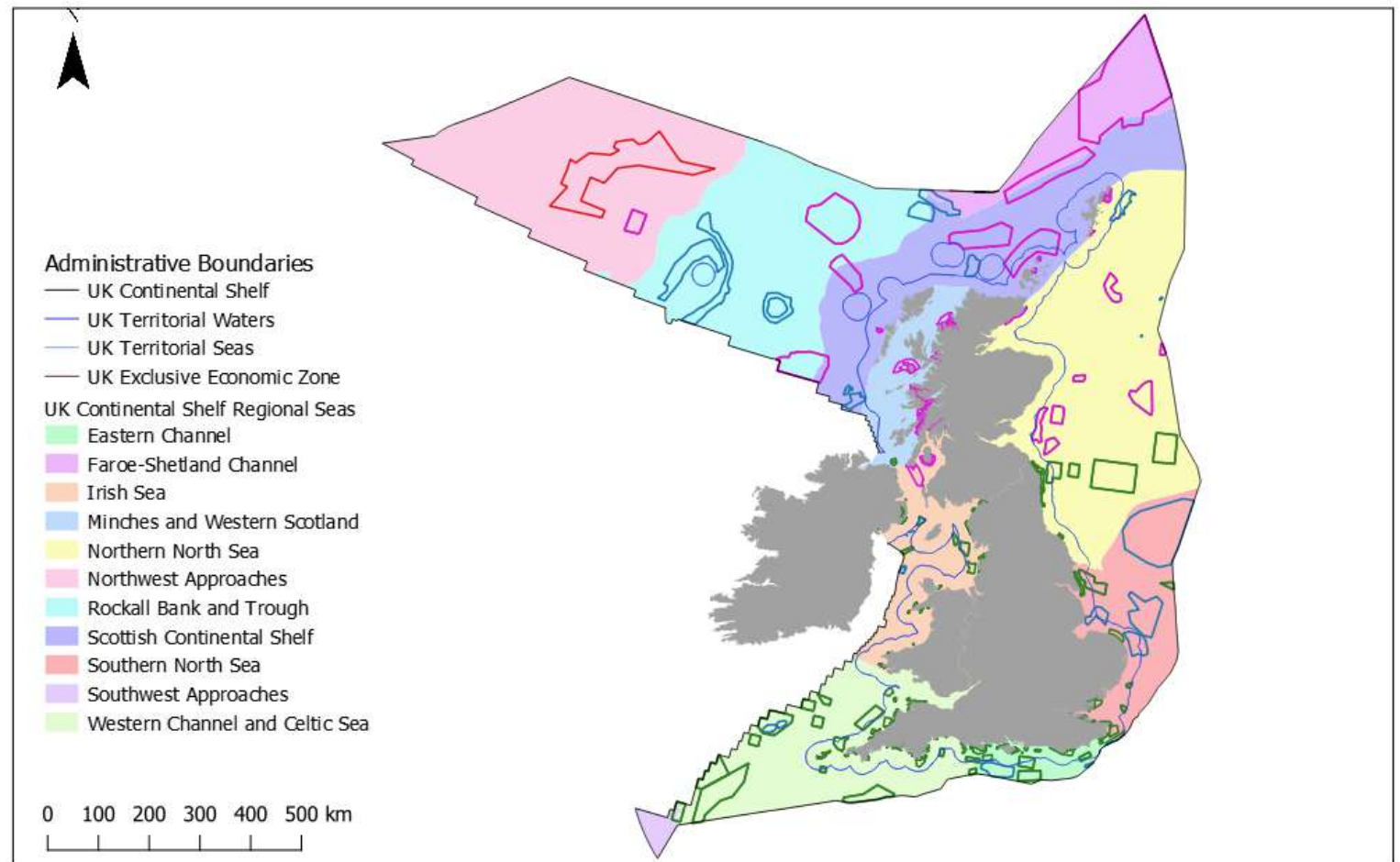- Coral gardens
- Deep-sea bed

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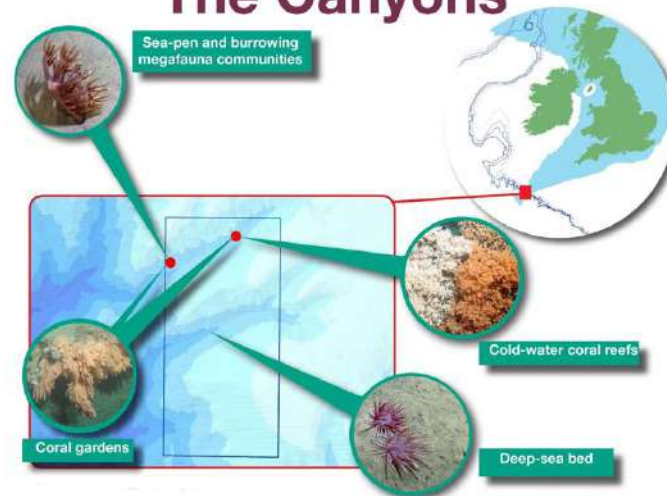
Monitoring UK offshore MPAs

Aim

- Collect evidence to assess the condition of the seabed features

Attributes

- Extent and distribution
- Structure and function
- Supporting processes

Administrative Boundaries
- UK Continental Shelf
- UK Territorial Waters
- UK Territorial Seas
- UK Exclusive Economic Zone

UK Continental Shelf Regional Seas
- Eastern Channel
- Faroe-Shetland Channel
- Irish Sea
- Minches and Western Scotland
- Northern North Sea
- Northwest Approaches
- Rockall Bank and Trough
- Scottish Continental Shelf
- Southern North Sea
- Southwest Approaches
- Western Channel and Celtic Sea

0   100   200   300   400   500 km

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Case Study: 2016 survey to the Geikie Slide and Hebridean Slope MPA

- NW of the Western Isles
- Designated for three features
  - Offshore deep-sea mud
  - Burrowed mud
  - Offshore subtidal sands and gravels
- Video and stills (drop camera)
- Infauna and PSA (box corer)

Case Study: 2016 survey to the Geikie Slide and Hebridean Slope MPA

Results

- Strong change in community with depth

- Rich infauna but sparse epifauna

- Widespread veneer of coarse sediment over muds and clays

Challenges

- What indicators should we be using?

- Spatial and temporal data limitations

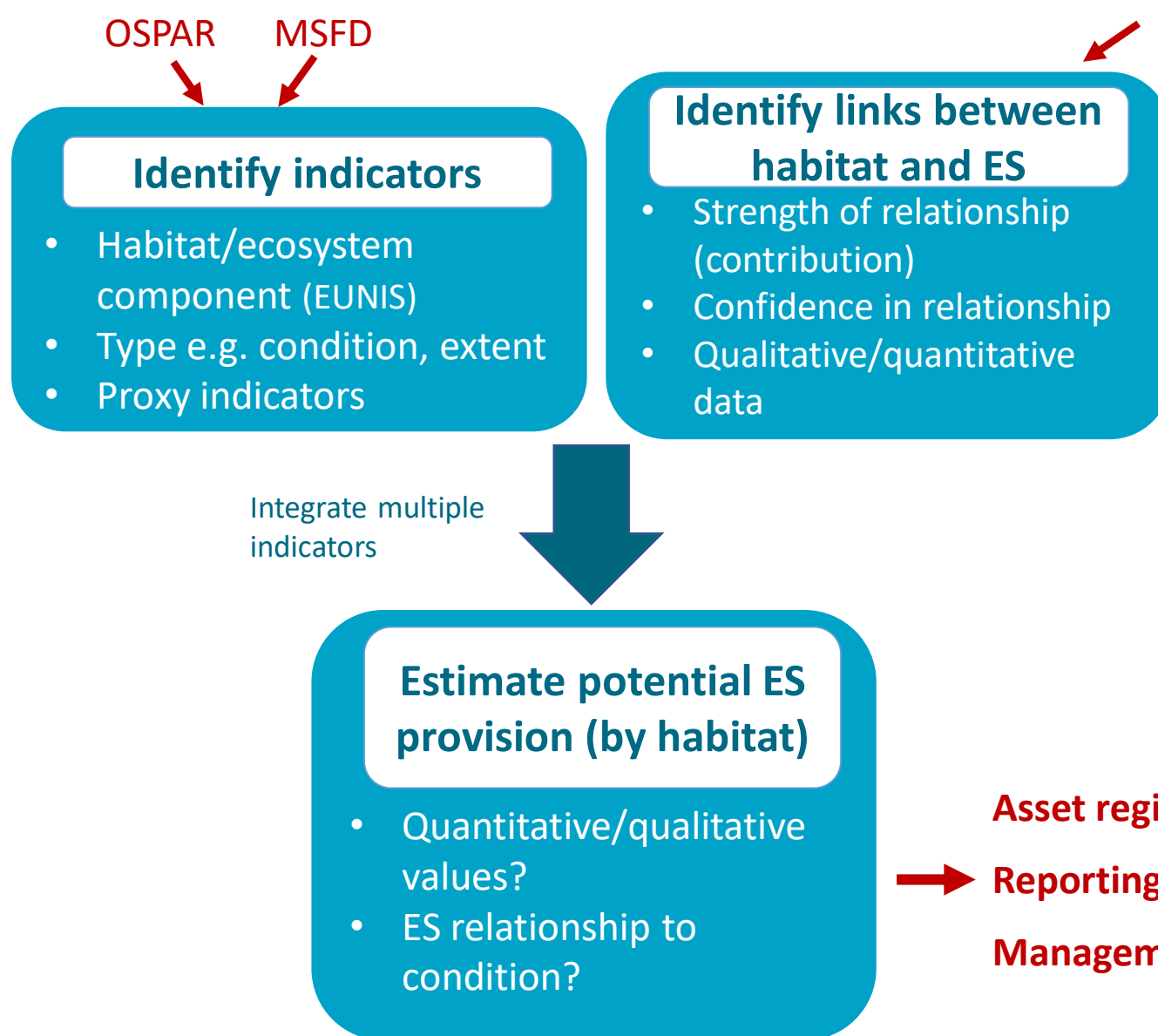- Lack of background environmental data
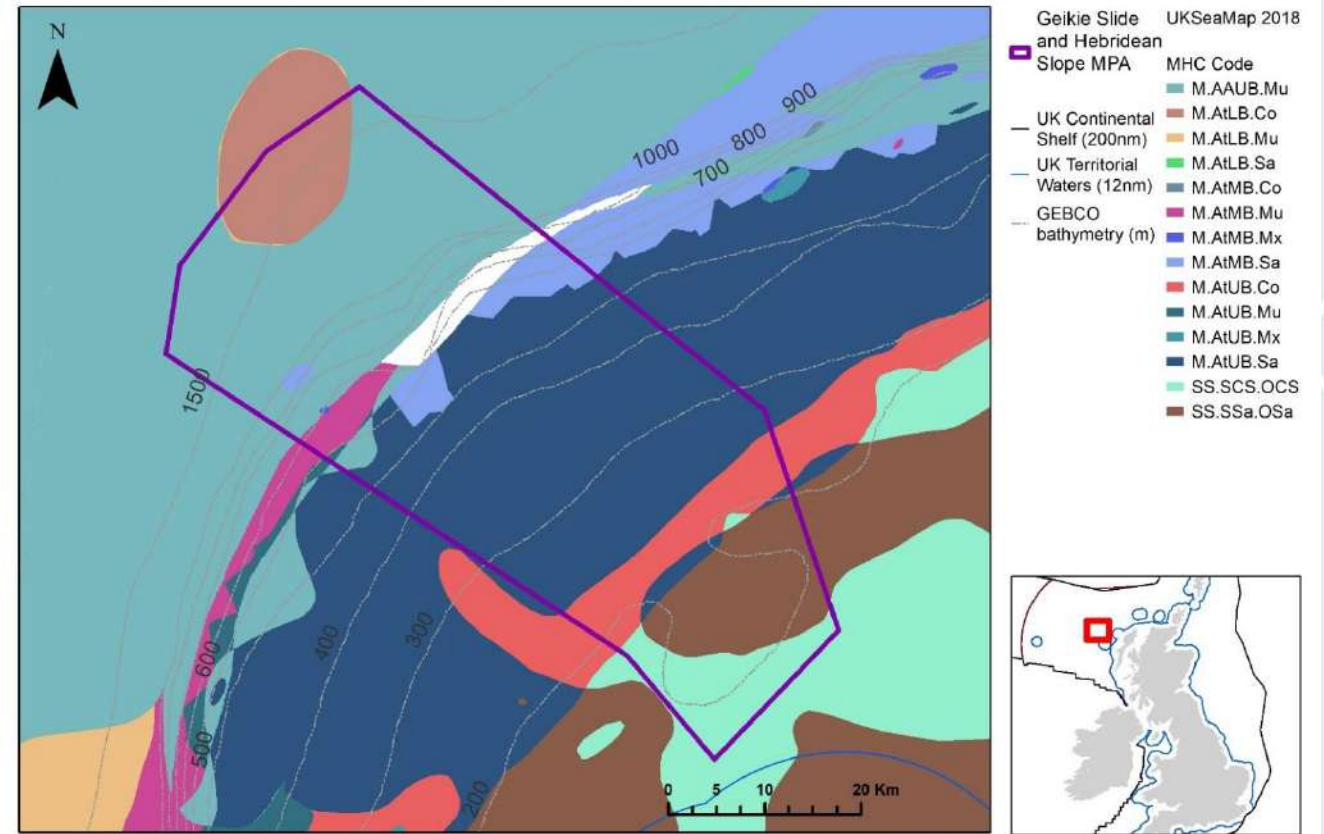
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UK Territorial Sea Limit. Contains UKHO data © Crown copyright. All rights reserved. UK Exclusive Economic Zone © Crown copyright. The exact limits of the EEZ are set out in The Exclusive Economic Zone Order 2013. World Vector Shoreline © US Defence Mapping Agency. Not to be used for navigation. Map and Inset Projection: WGS84 UTM Zone 30N.
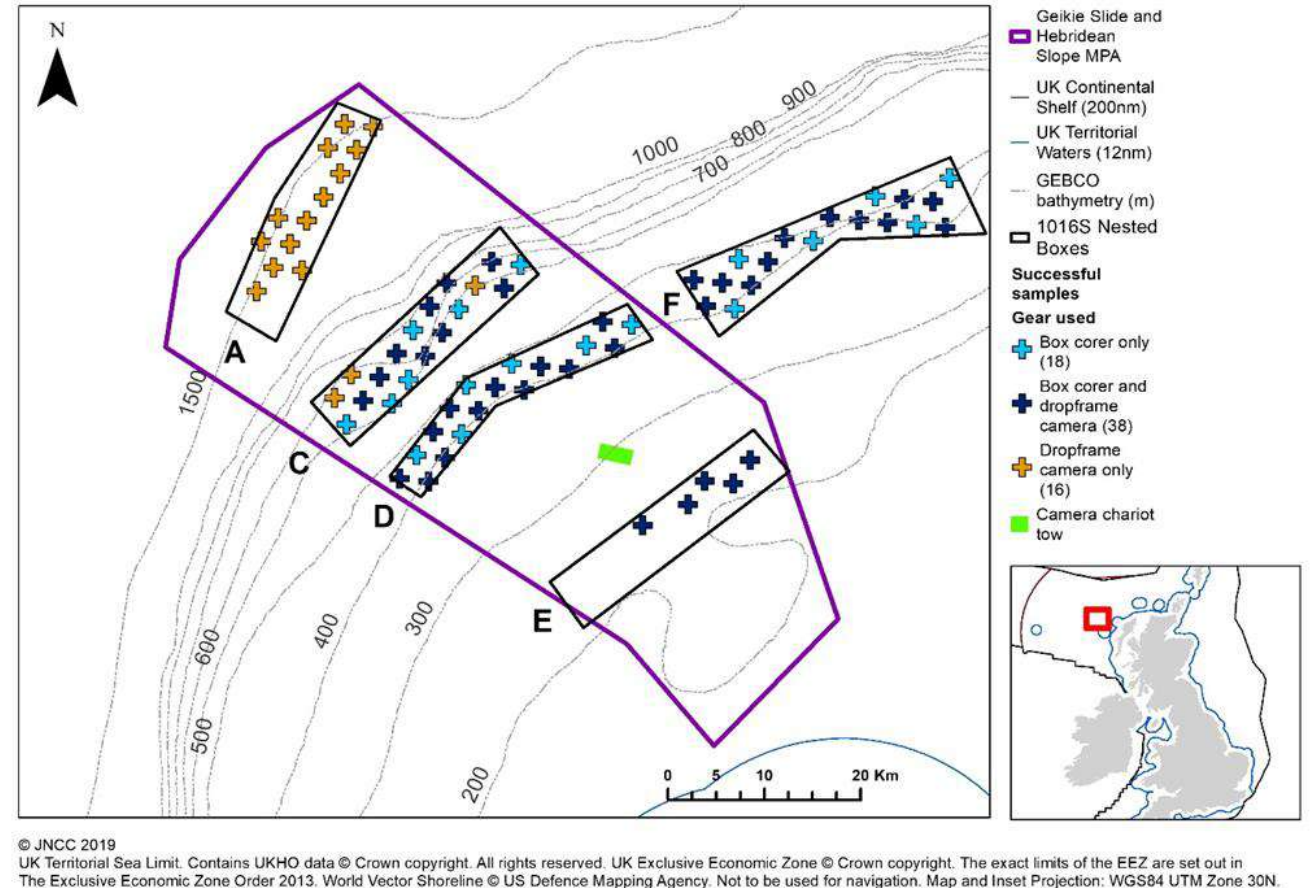
Can we use marine biodiversity indicators to estimate the provision of ecosystem services?

https://biodiversity.europa.eu/maes

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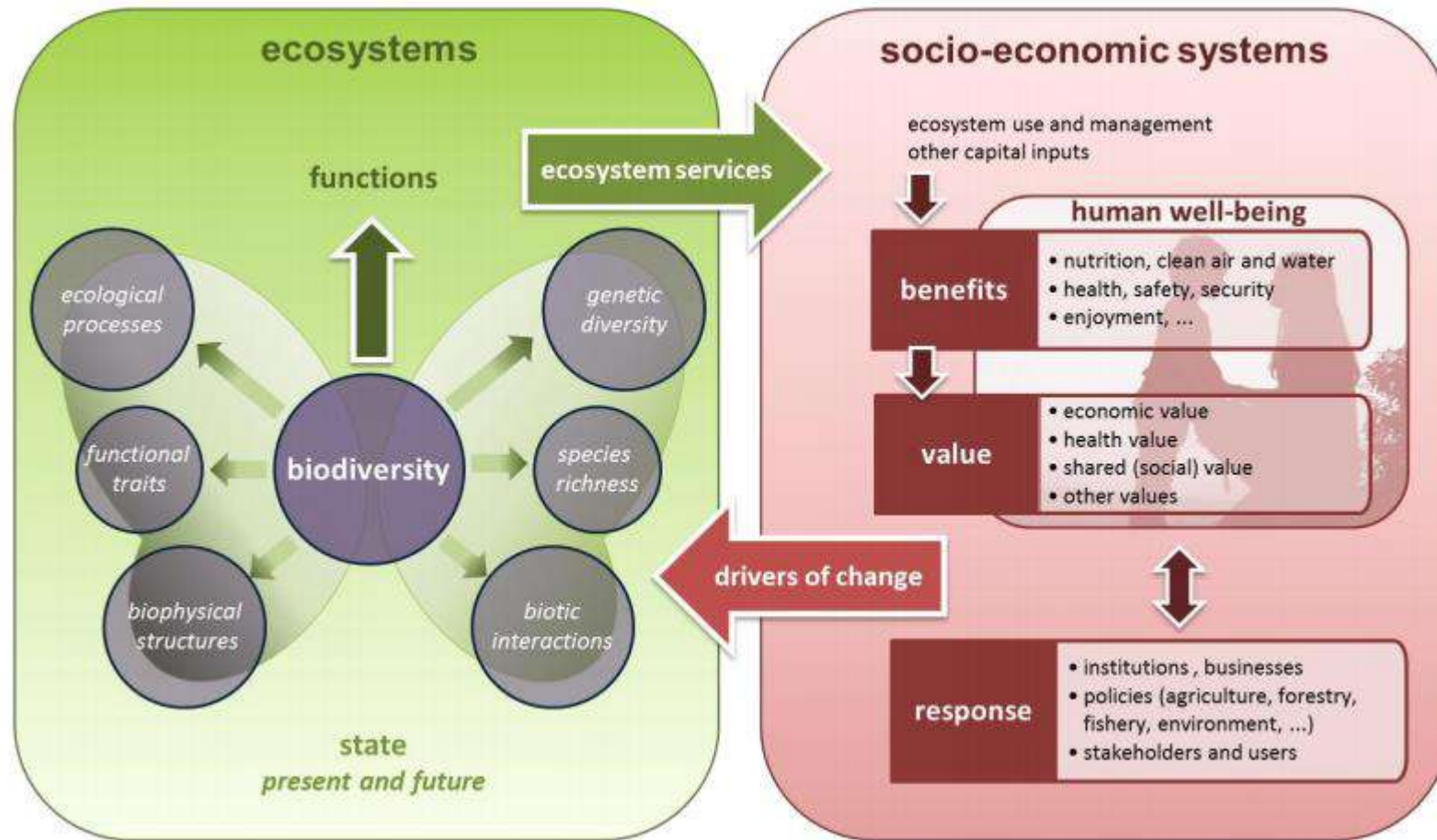
Linking indicators to ES provision

OSPAR   MSFD

Identify indicators

- Habitat/ecosystem component (EUNIS)
- Type e.g. condition, extent
- Proxy indicators

Identify links between habitat and ES

- Strength of relationship (contribution)
- Confidence in relationship
- Qualitative/quantitative data

Integrate multiple indicators

Estimate potential ES provision (by habitat)

- Quantitative/qualitative values?
- ES relationship to condition?

Asset register

Reporting

Management

Habitat – ES Matrix

| Ecosystem component /EUNIS code | | Intermediate services | | | | | | | | | | | Goods/Benefits | | | | | | | | | | | | | |
		Supporting services						Regulating services						Provisioning				Cultural services						
		Primary production	Larval and gamete supply	Nutrient cycling	Water cycling	Formation of species habitat	Formation of physical barriers	Formation of seascape	Biological control	Natural hazard regulation	Waste breakdown and detoxification	Carbon sequestration	Healthy climate	Prevention of coastal erosion	Sea defence	Waste burial / removal / neutralisation	Food (wild, farmed)	Fish feed (wild, farmed, bait)	Fertiliser and biofuels	Ornaments and aquaria	Medicines and blue biotechnology	Tourism and nature watching	Spiritual and cultural well-being	Aesthetic benefits	Education and Research	Physical health benefits	Psychological health benefits
Seagrass beds: A5.53, A5.545, A2.61	Contribution to ES																										
	Confidence in evidence	2	1	2	1	3	1	1	2	1	2	2	2	2	2	2	3	1	2	2	1	2	1	2	1		

(Adapted from Saunders et al, 2015)

The potential of a habitat to deliver an ES is dependent upon the **extent** and **condition** of the habitat (Culhane et al, 2014)
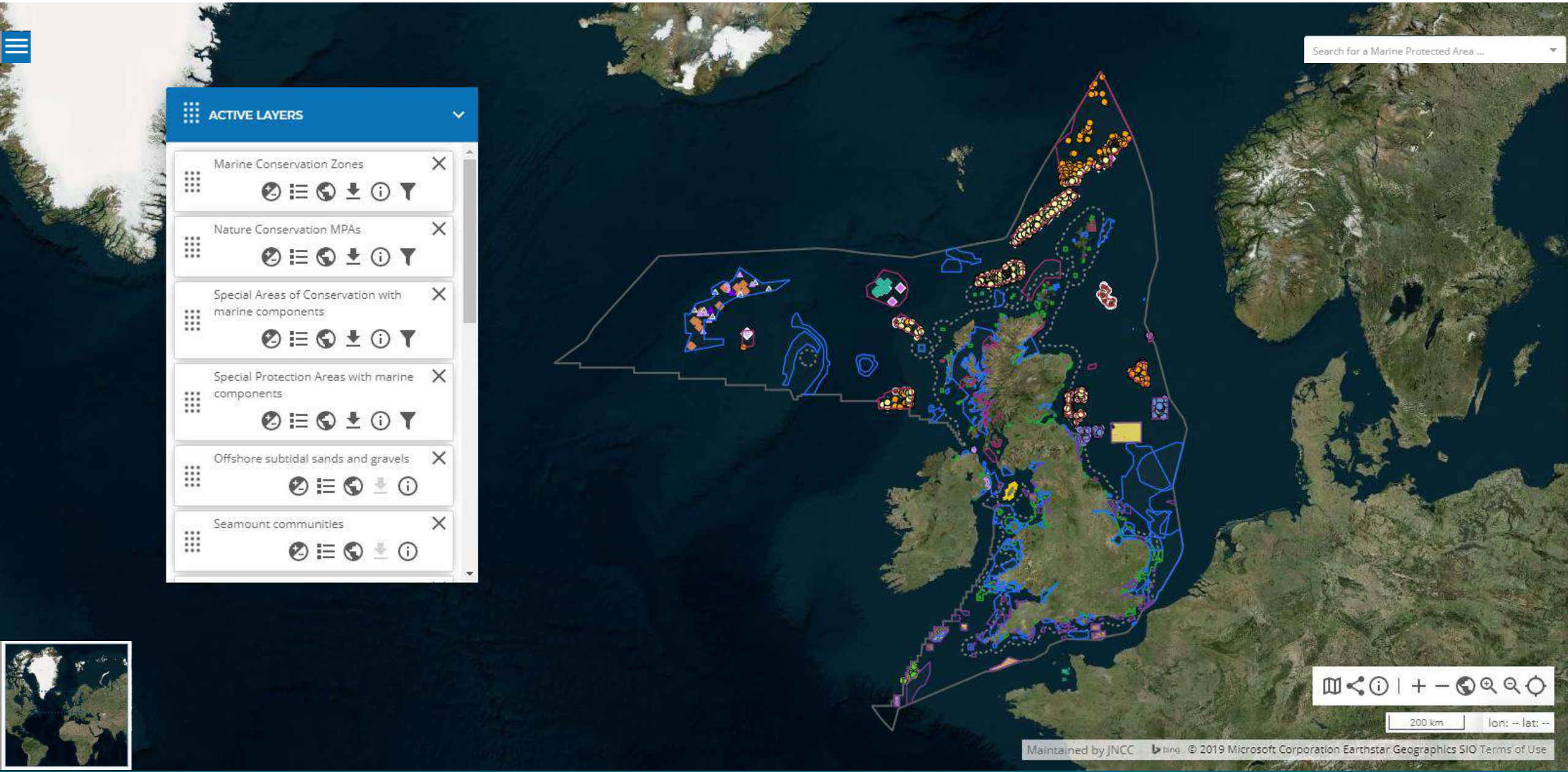
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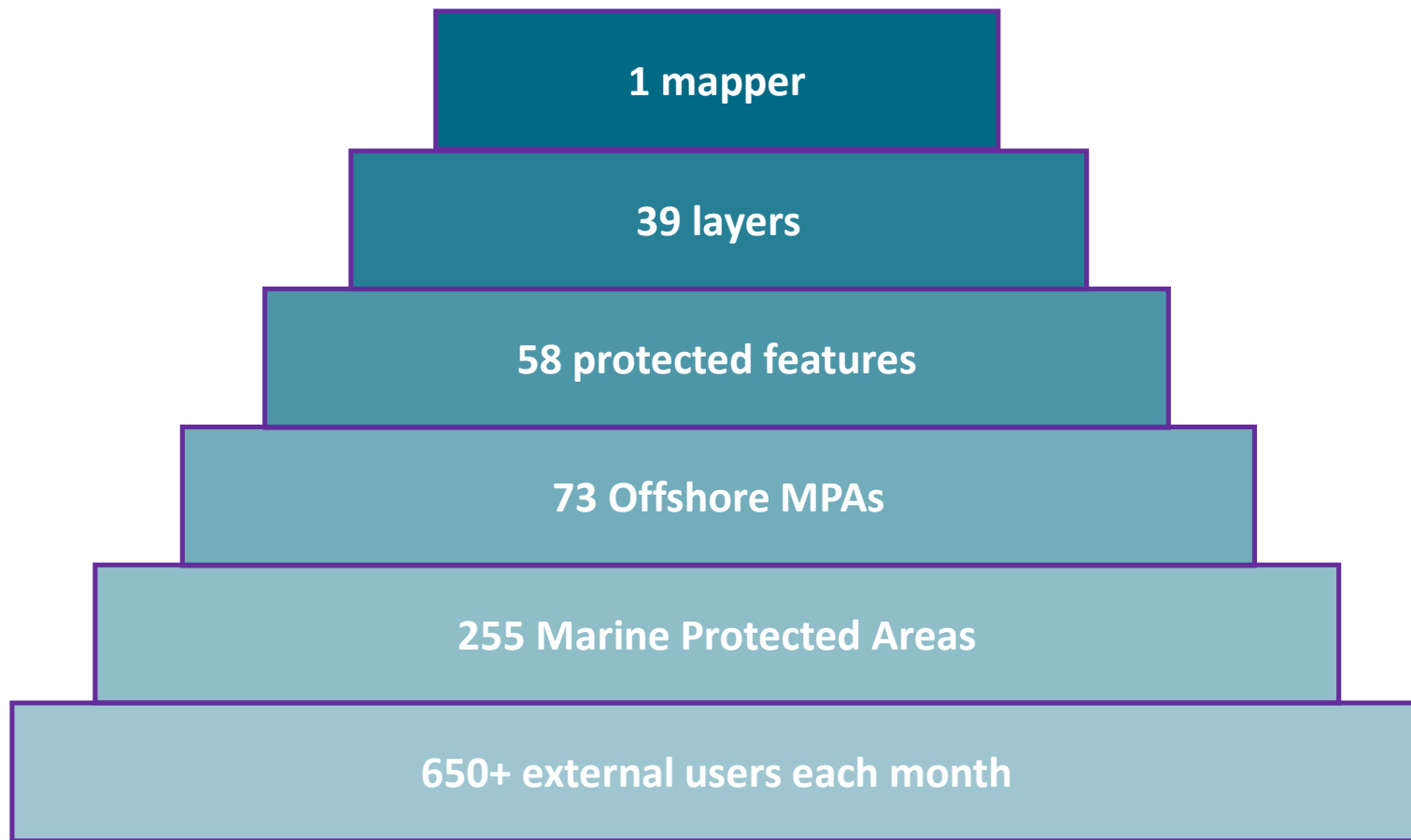# Future Development

- EUNIS level
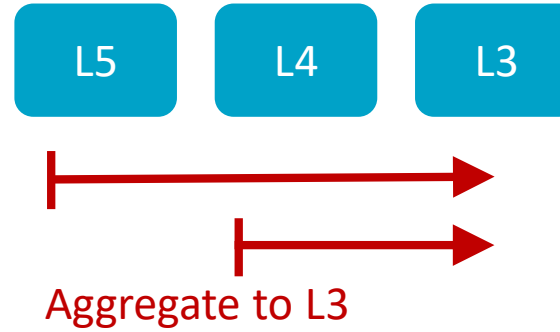
- Understanding the relationships between ecosystem components and ES
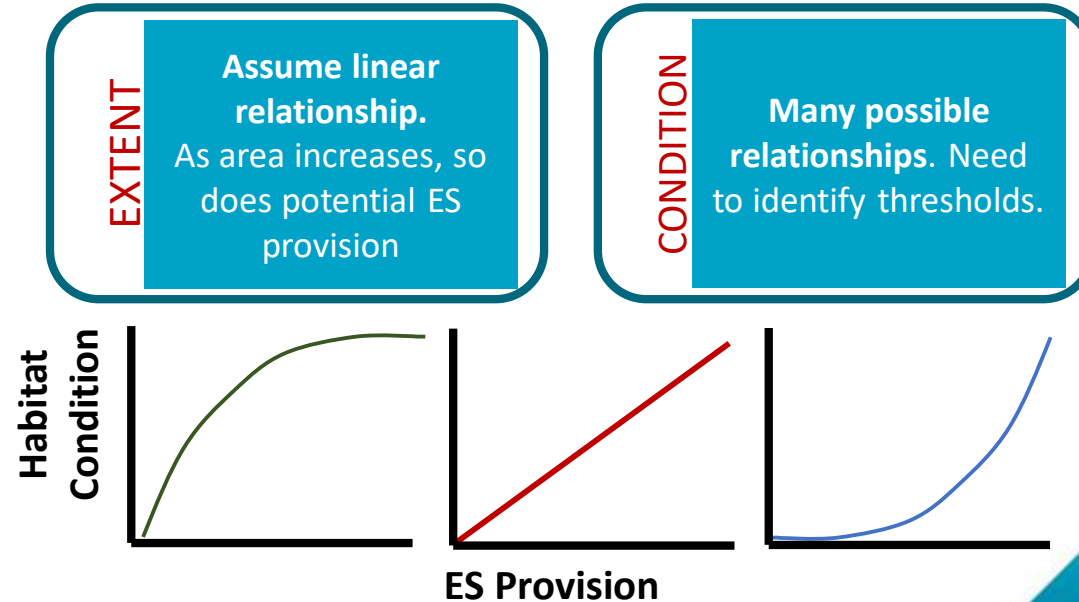
UK MPA mapper - jncc.gov.uk/mpa-mapper

So where do we go from here?

- Track the development of the MPA network alongside other spatial measures

- Expand the mapper scope to include management measures

- Develop the functionality to enhance the user experience

- **We need your help!**
  - **Visit: jncc.gov.uk/mpa-mapper**
  - **Send us your thoughts**

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