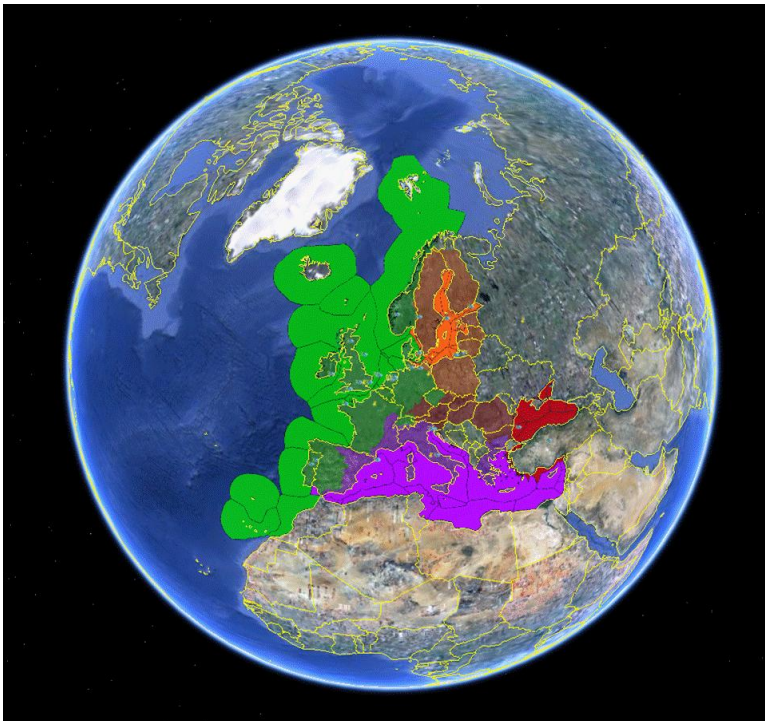


Socio-economics & ecology application to MSFD, renewables & fisheries

Lessons from the FP7 Knowseas project
Knowledge-based management of Europe's Seas



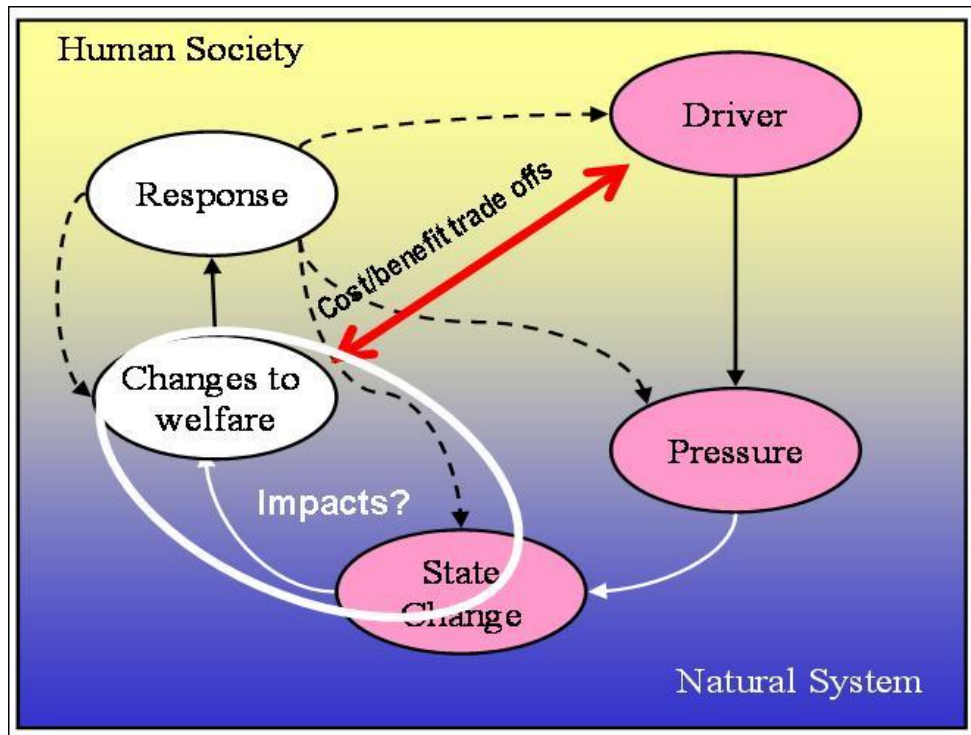
Dr Peter J Kershaw
Cefas, Lowestoft, UK

MSFD – Managing at EEZ scale

Knowseas – Knowledge-based management of Europe's Seas

Overall objective: *A comprehensive scientific knowledge base & practical guidance for the application of the **Ecosystem Approach** to the sustainable development of Europe's regional seas*

Ecosystem Approach – *a resource planning and management approach that recognizes the connections between land, air water and all living things, including people, their activities and institutions.*

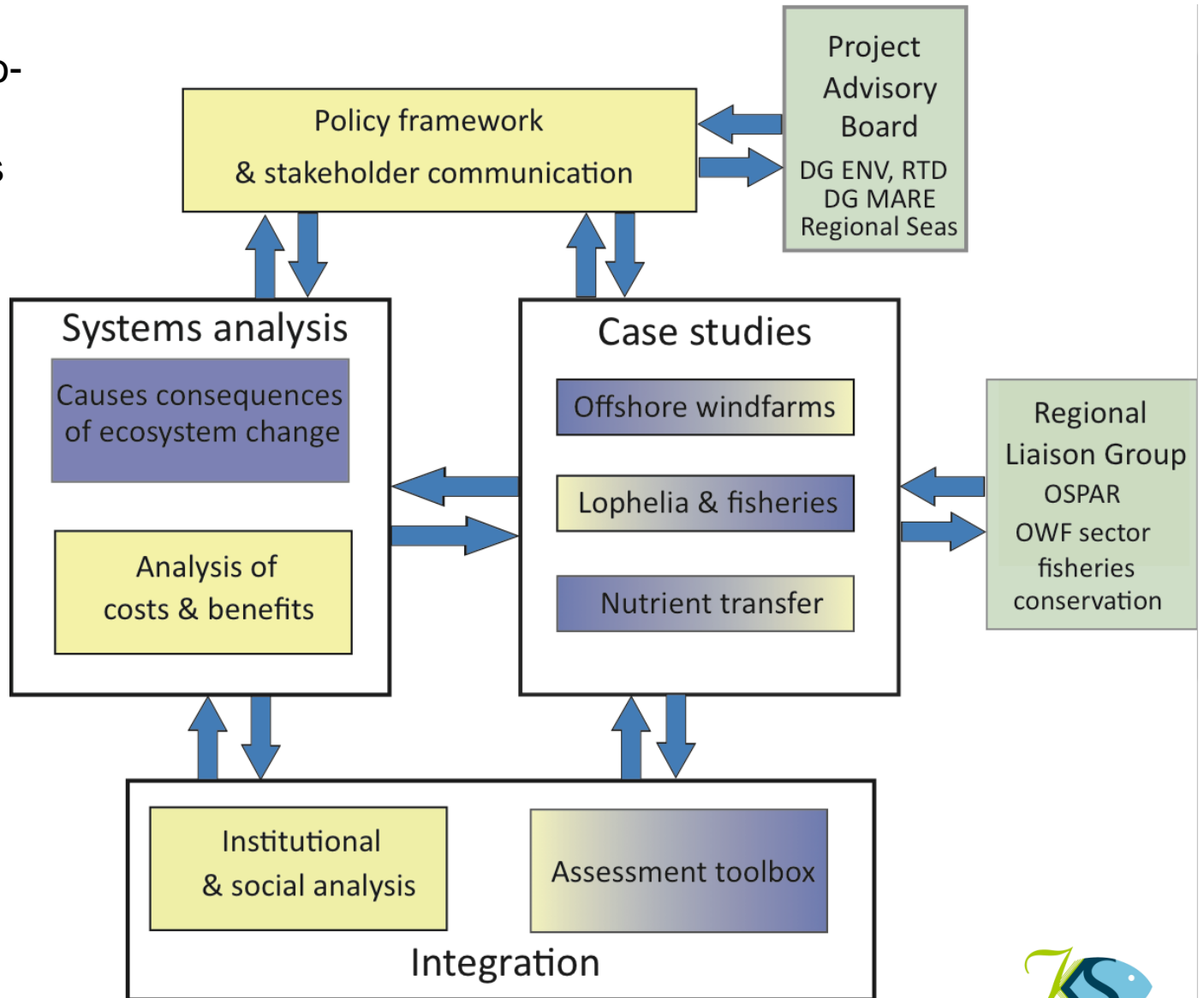


DPSWR – DPSIR
W = Changes to Welfare



Knowseas project structure

Integrating socio-economics with natural sciences



Terminology – finding a common language

regime shifts

ecology

1958-1979

1980-1999

Warm-temperate species

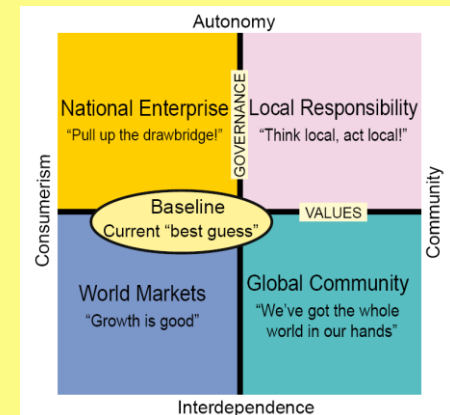
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Carbon Dioxide Residence Time

regulation

baseline

Socio-economics/politics



Knowseas – selection of case studies

Selection criteria:

- Choice of scale appropriate?
- Availability of information/data adequate?
- Including key/emerging issues?
- Effective use of available resources/expertise?

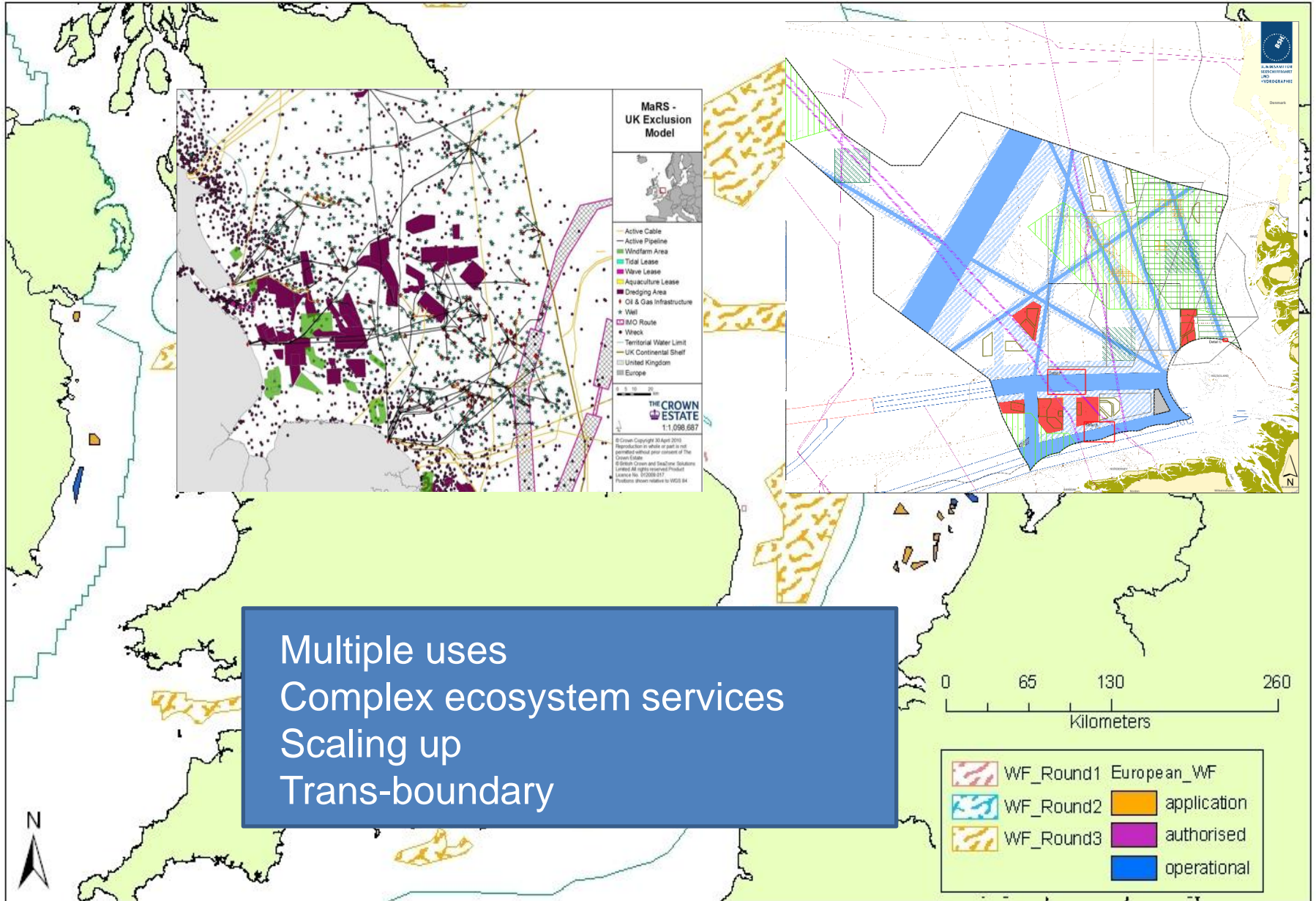
Offshore Windfarms

Variable space- & time-scales – ecology, sector & management

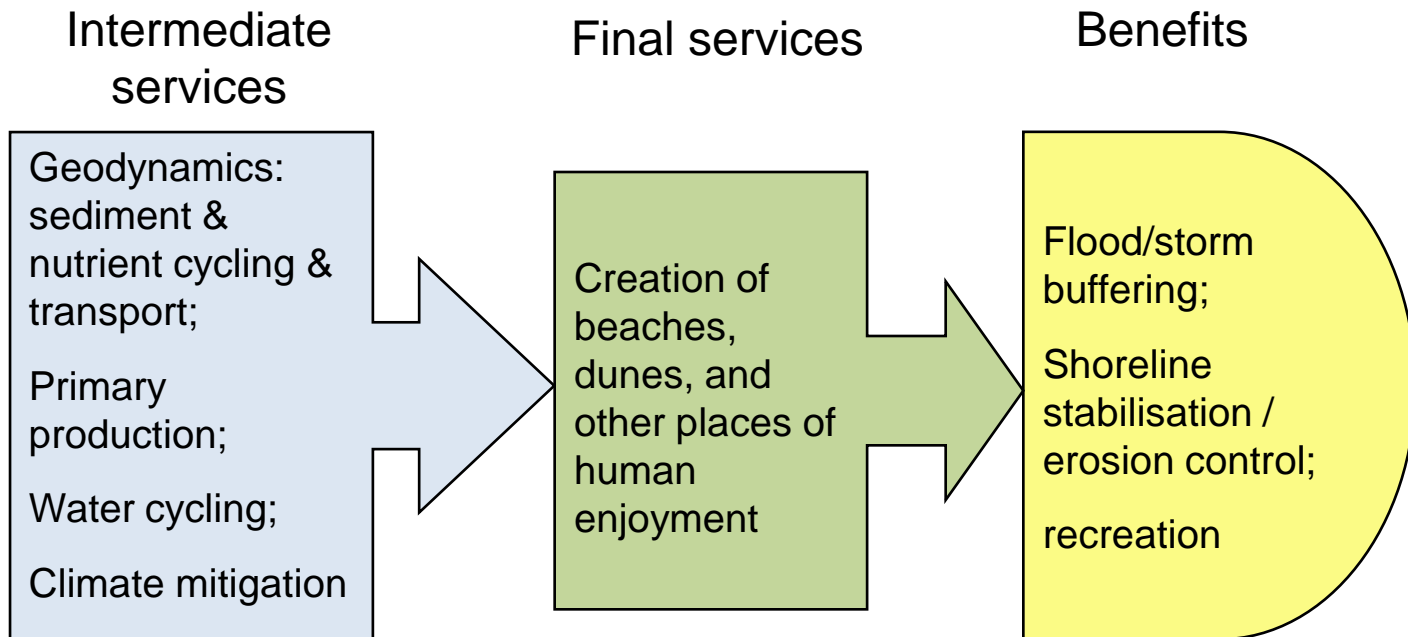
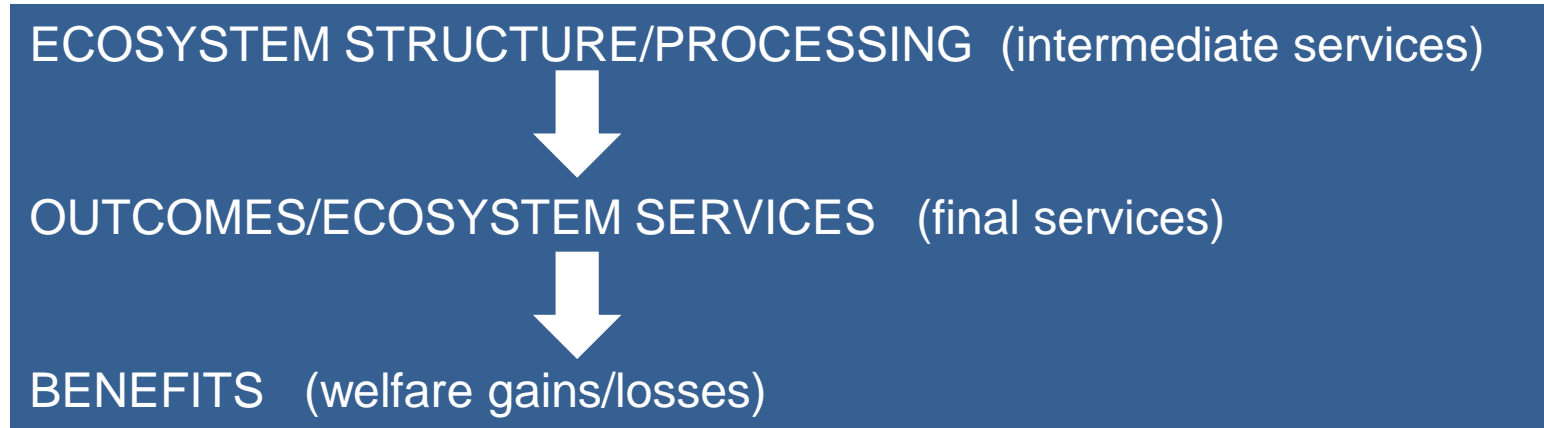


OWF

Wind farm locations around the UK and neighbouring areas.



Knowseas – examples of ecosystem benefits



Benefits & ecosystem services before OWF construction

Benefit	Measurement (physical units)	Ecosystem Services (ESS)	Possible estimation means
Catch of demersal/pelagic fish	Annual catch (tons)	Production of biomass Provision of habitat Maintenance of food web structure & function Maintenance of biodiversity	IEA, EwE, landings data
Preservation/protection of species, habitats & ecosystems of conservation value	Area equivalent to OWF footprint	Production of biomass Provision of habitat Maintenance of food web structure & function Maintenance of biodiversity	IEA, EwE
'pristine' seascape	Area		Questionnaires, GIS visualisation, highly subjective
Shipping	Area, number, type and size of ships	Transport of goods	GIS, vessel counts

IEA – integrated ecosystem assessment using statistical analysis

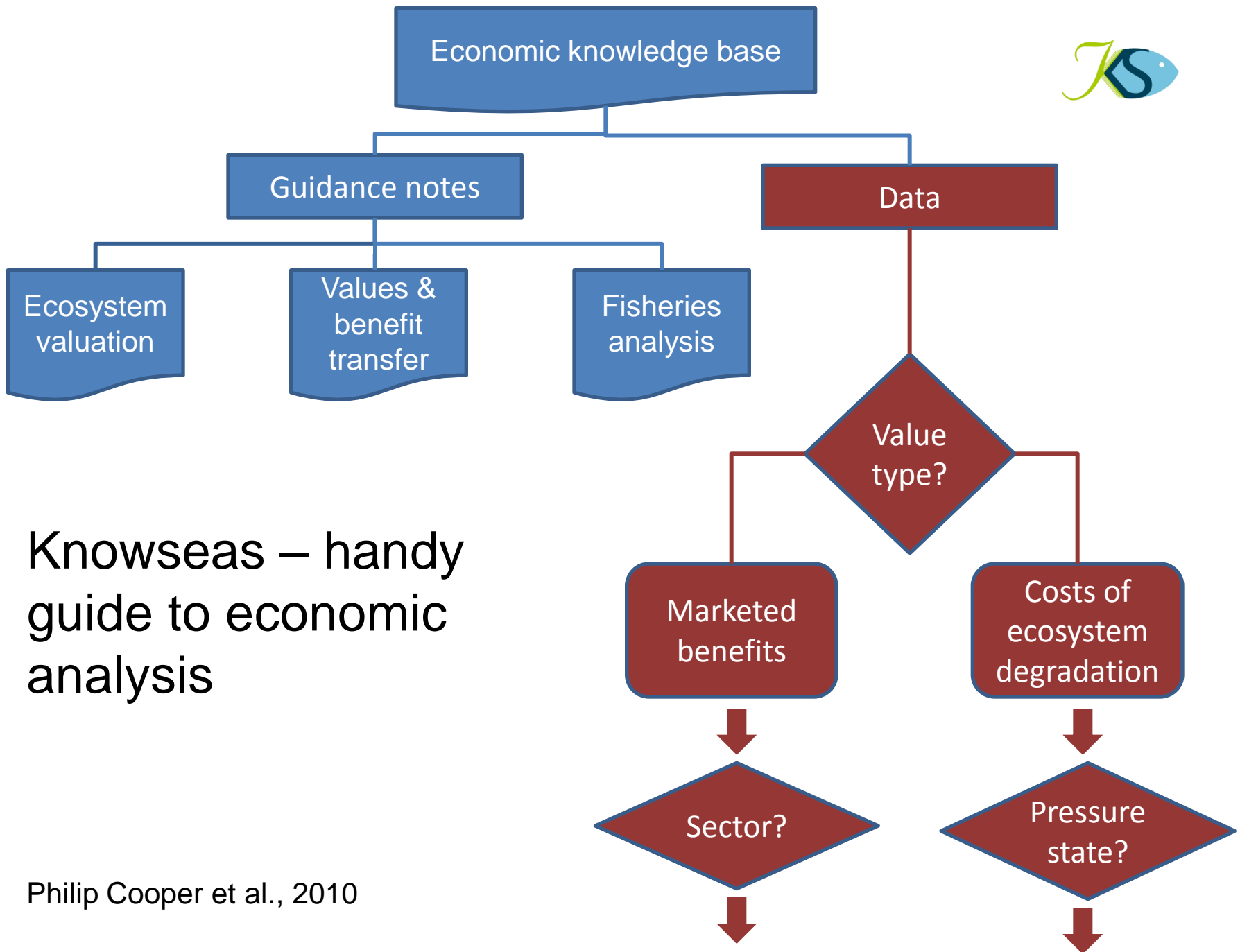
EwE – Ecopath with Ecosim ecosystem model



Examples of potential impacts of OWF – exclusion zone

Pressure - exclusion zone affecting shipping & fisheries	
State - spatial extent of exclusion zone	
State change	Welfare impact
Loss of fishing grounds	Displaced fishing effort
	Reduction in income
Restricted shipping lanes/increased use of pilots	Increased costs
	Increased risk of collision
No-fish zone reduces fisheries pressure within OWF	Increased biodiversity
	Increased productivity
	Increased/decreased food provision outside zone depending upon scaling effects
No-fish zones increases fisheries pressure outside OWF	Reduced productivity
	Increased habitat destruction
	Unsustainable increase in fisheries pressure

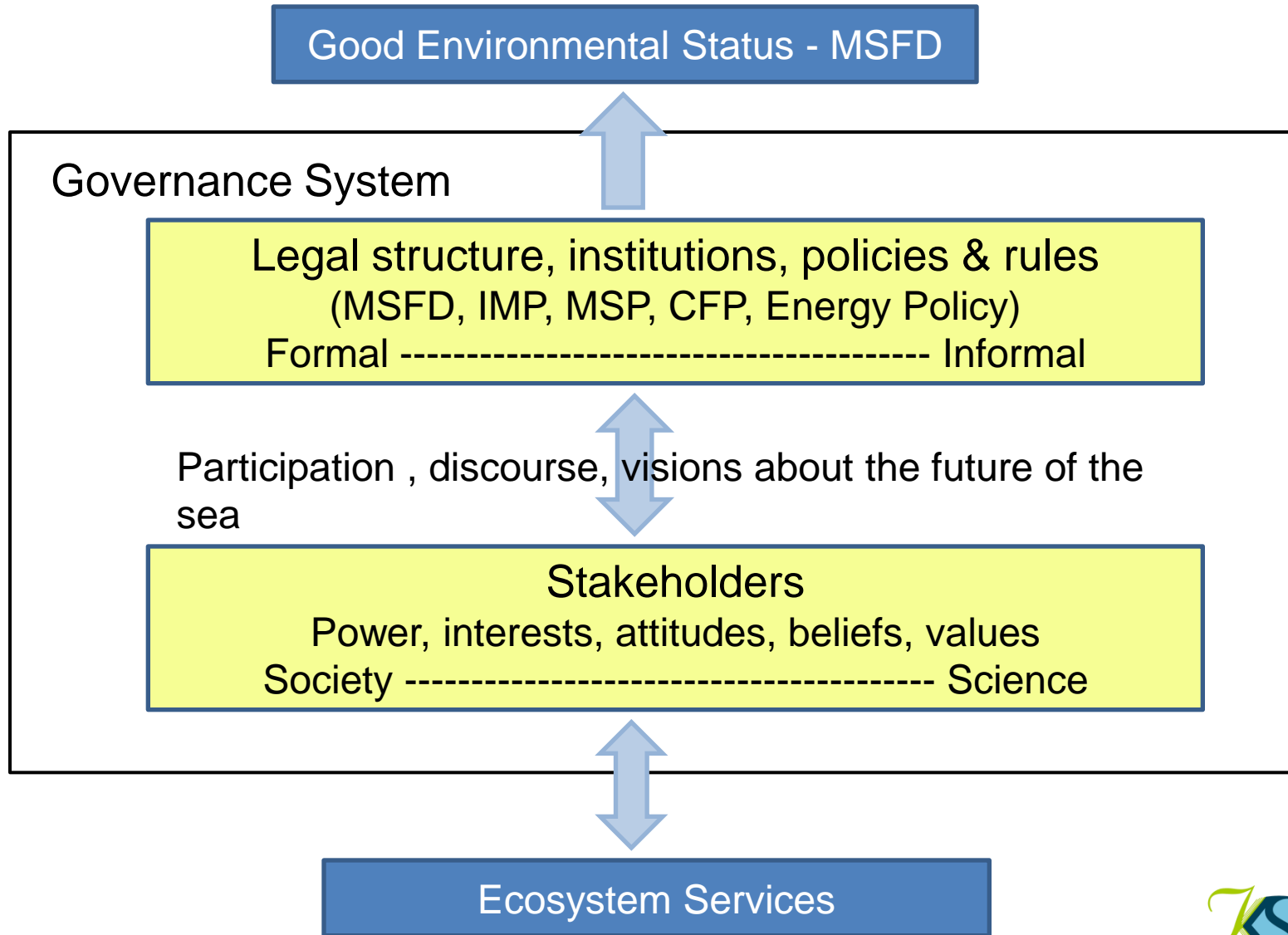




Knowseas – handy guide to economic analysis

Philip Cooper et al., 2010

Knowseas – Analytical framework for institutional analysis



Knowseas Tools - Decision Space Analysis

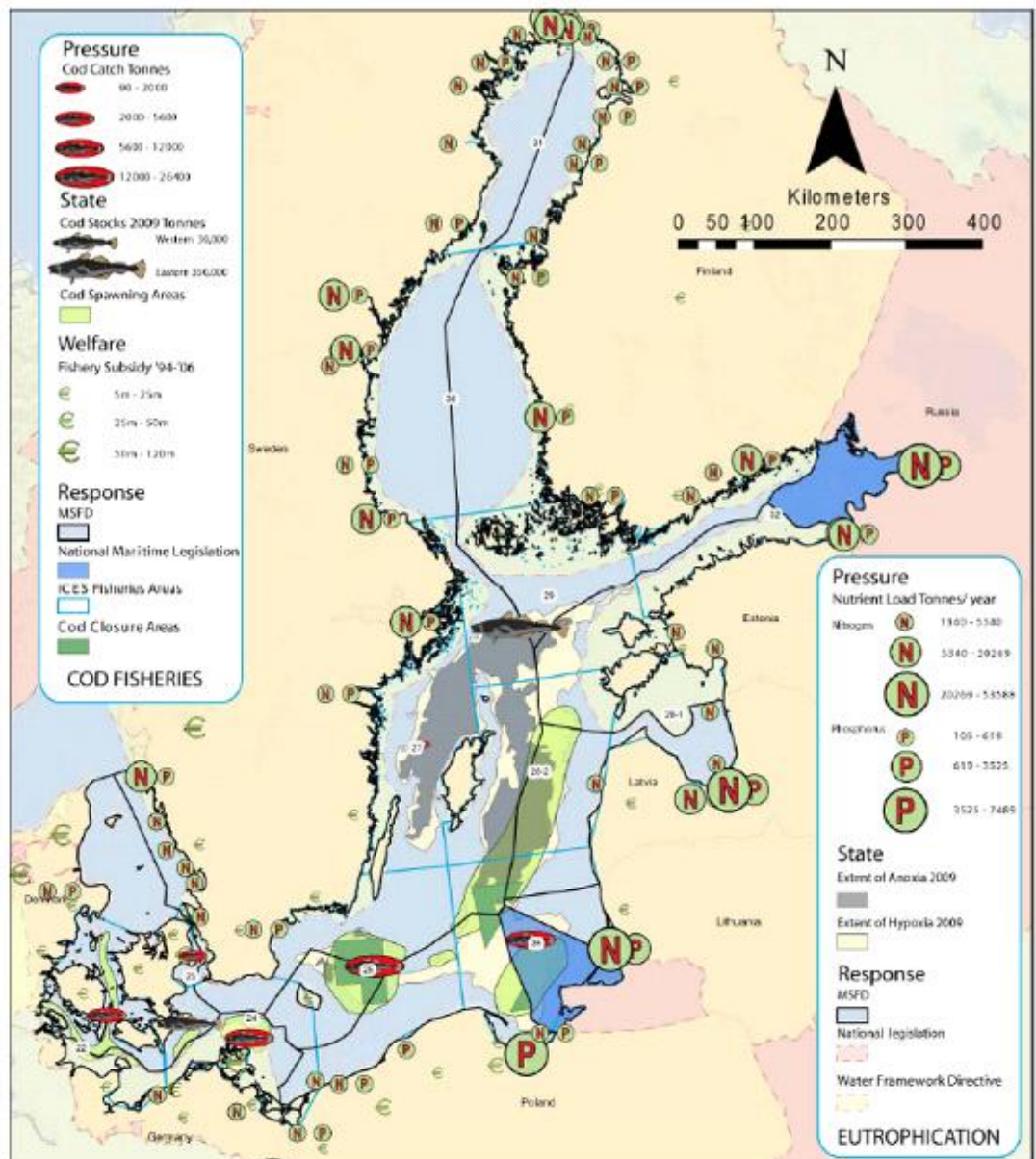
cod fisheries and eutrophication in the Baltic Sea.

Pressure

State change

Welfare impact

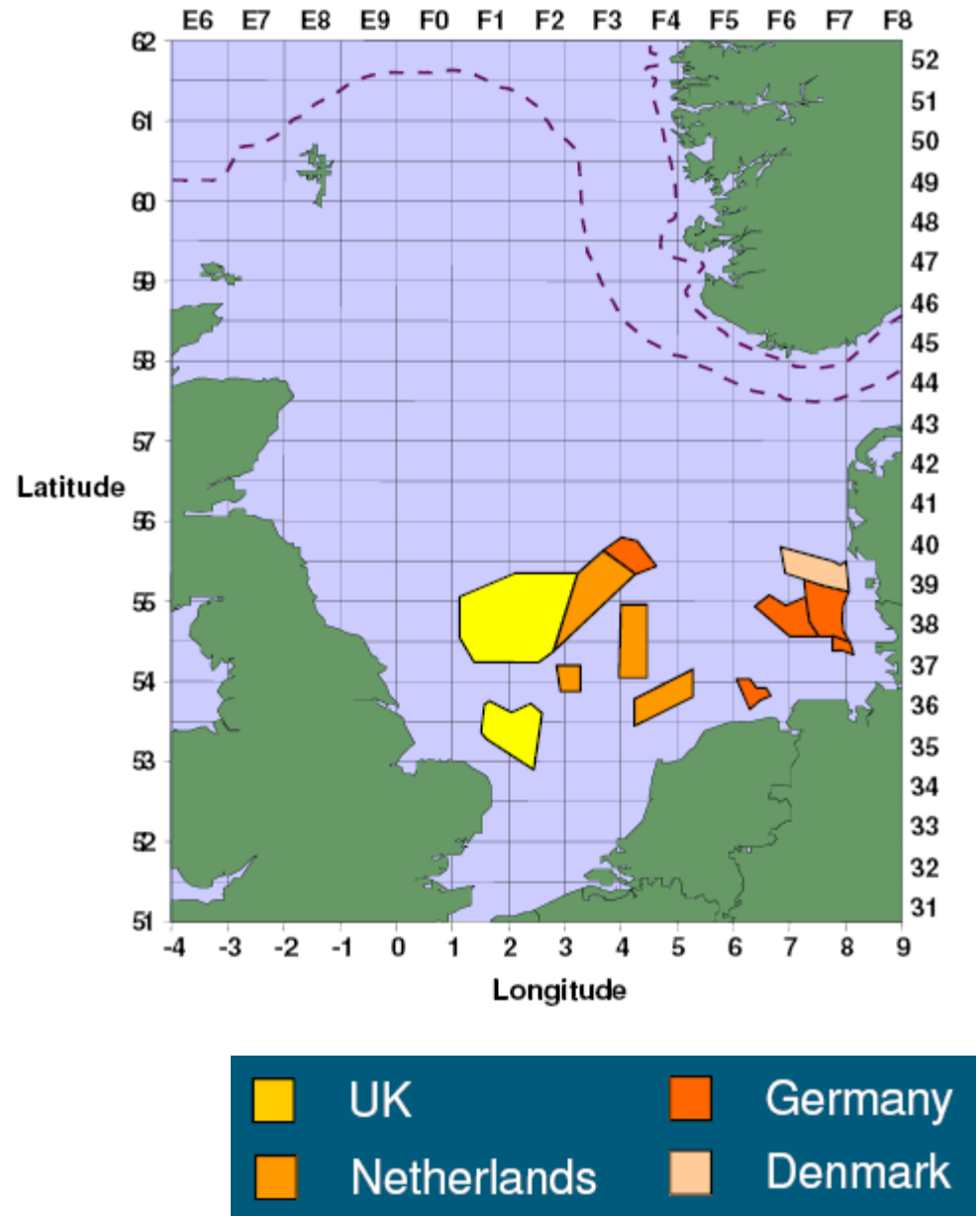
Response



Modelling the impact of exclusion zones

Proposed offshore SACs and SPAs in the North Sea (SACs - Natura 2000)

Impact of closures on sandeel fishery



Modelling the impact of exclusion zones - Ecospace Model (Ecopath with Ecosim)

Within MPA

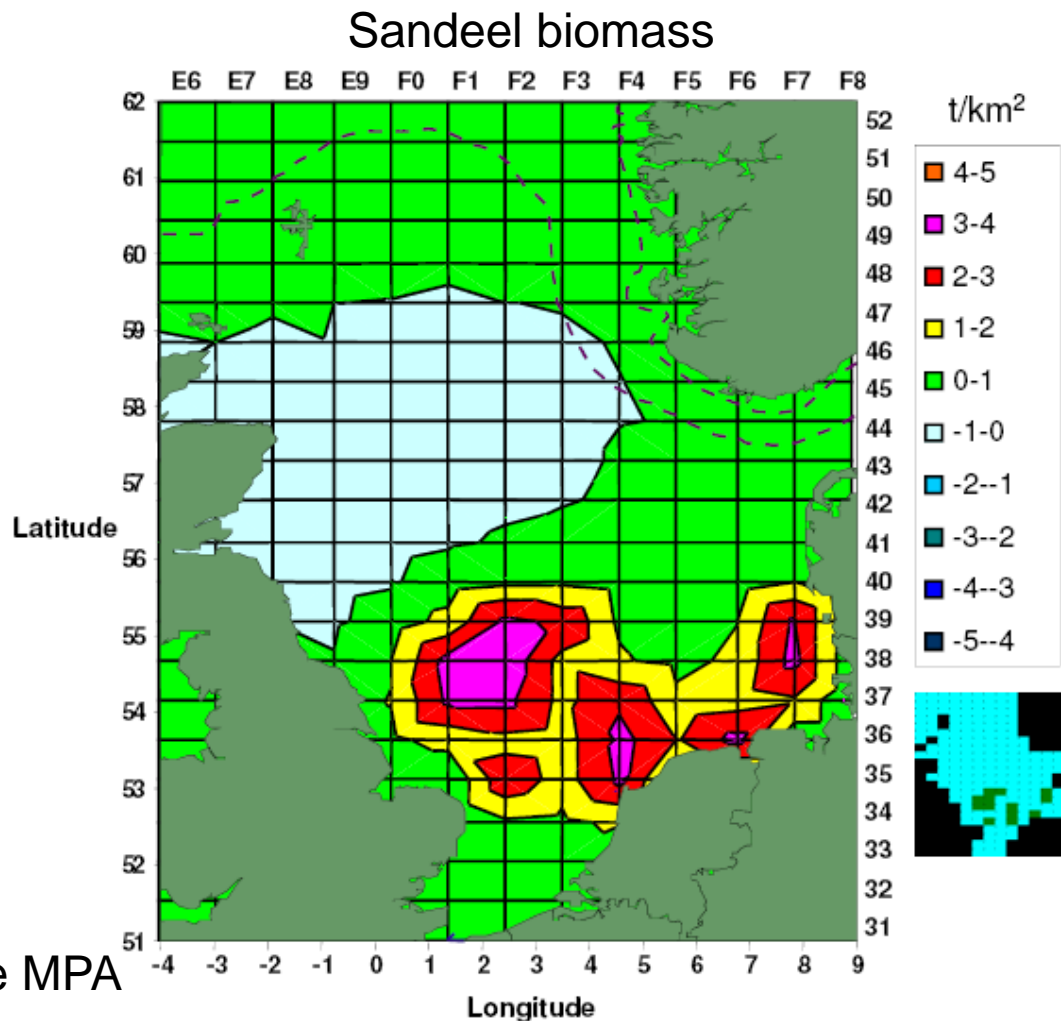
- Sandeel biomass increased 6.2%
- Predator biomass increased (e.g. whiting by 15.8%, spurdog by 23%)

Greater North Sea

- Sandeel fishery displaced to Firth of Forth (total catch unchanged)
- Total North Sea catch increased by 3.2%

Uncertainties

- Longer –term impacts outside MPA
- Income (e.g. fuel prices)



Conclusions

- Be aware of terminology differences (e.g. regulation)
- Be open minded to different perspectives and approaches (e.g. DPSWR)
- Essential to work together, not in silos
- Cannot put a financial value on everything (ethics)
- Socio-economics is more than economics
- Natural systems & social systems work to different space- and time-scales