

ELME – the final phase

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ELME
European Lifestyles
Marine Ecosystems

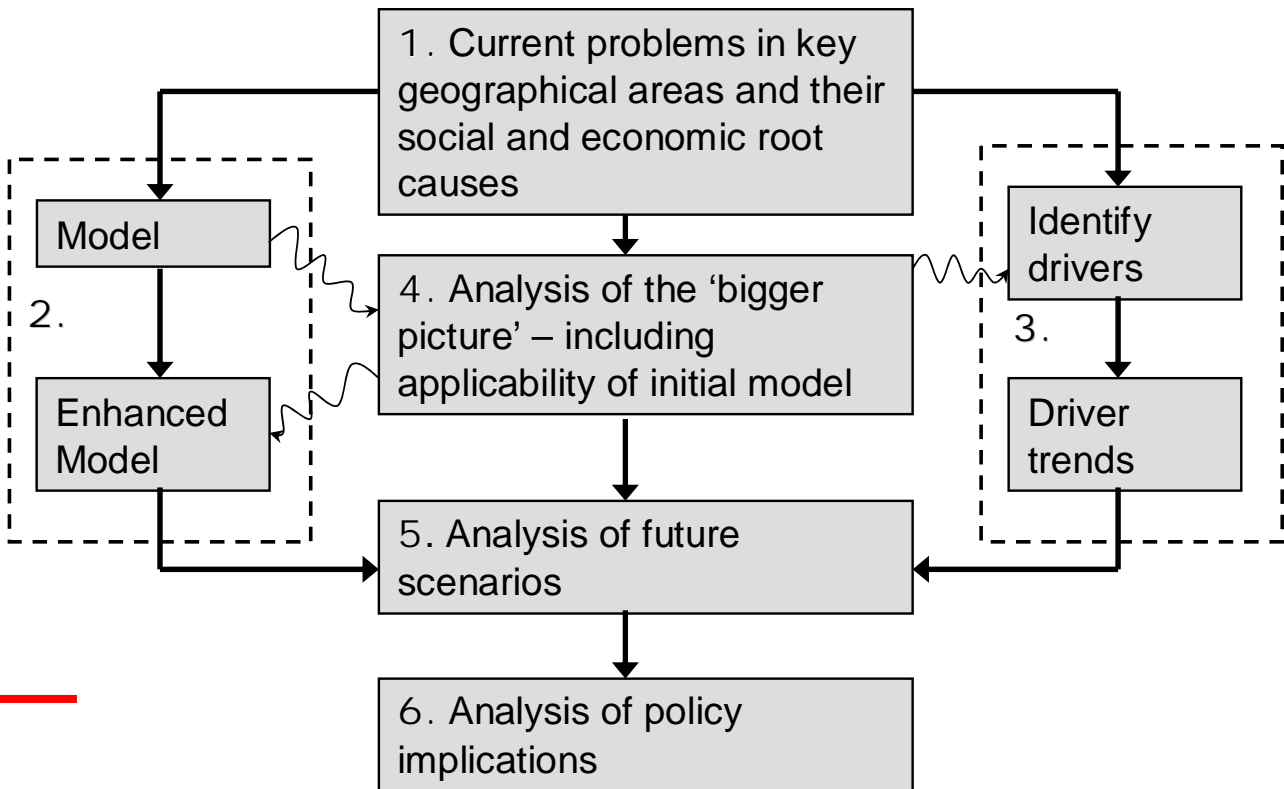
Marine Institute
UNIVERSITY OF PLYMOUTH



Timeline

Current situation

Future scenarios



24. Integration of a Europe-wide conceptual model	Module 5 Working group comprised of the core team plus the regional seas coordinators (WP1).	Paper for the wrap up workshop	140-144 Plymouth
PHASE V: POLICY IMPLICATIONS AND WRAP UP (12 weeks)			
25. Policy implications study (follow up to work of Module 3 with feed-back from Activity 24).	Module 6. Core group plus TT6	Report to the wrap-up conference (and the Commission)	145-151
26. Wrap-up scientific conference (Third ELME Scientific Workshop) to present formal scientific reports representing the project output	All leading scientists in project. Special media session to be included.	Formal papers will be edited for a special volume	152 Venue to be decided
27. Presentation of project summary report and proposals for follow-up activities	Project coordinator	Report to the Commission	156

Policy needs for ELME

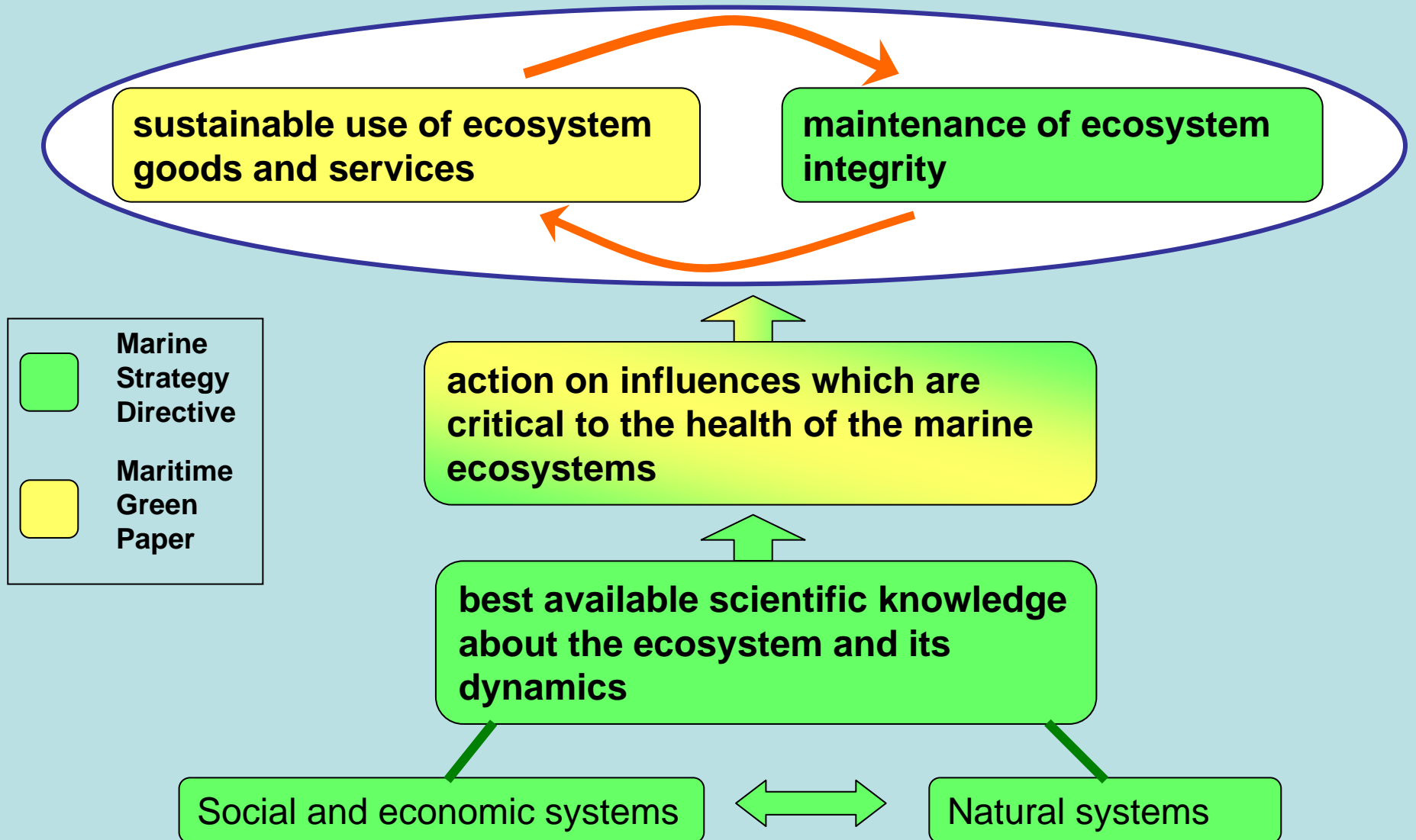


I. The Ecosystem Approach

The Ecosystem Approach is the comprehensive integrated management of human activities, based on best available scientific knowledge about the ecosystem and its dynamics, in order to identify and take action on influences which are critical to the health of the marine ecosystems, thereby achieving sustainable use of ecosystem goods and services and maintenance of ecosystem integrity.

EU Marine Strategy Stakeholder Workshop, Denmark, 4 – 6 December 2002

A two pillar approach for the *comprehensive integrated management of human activities*



Some features of coupled social and ecological systems



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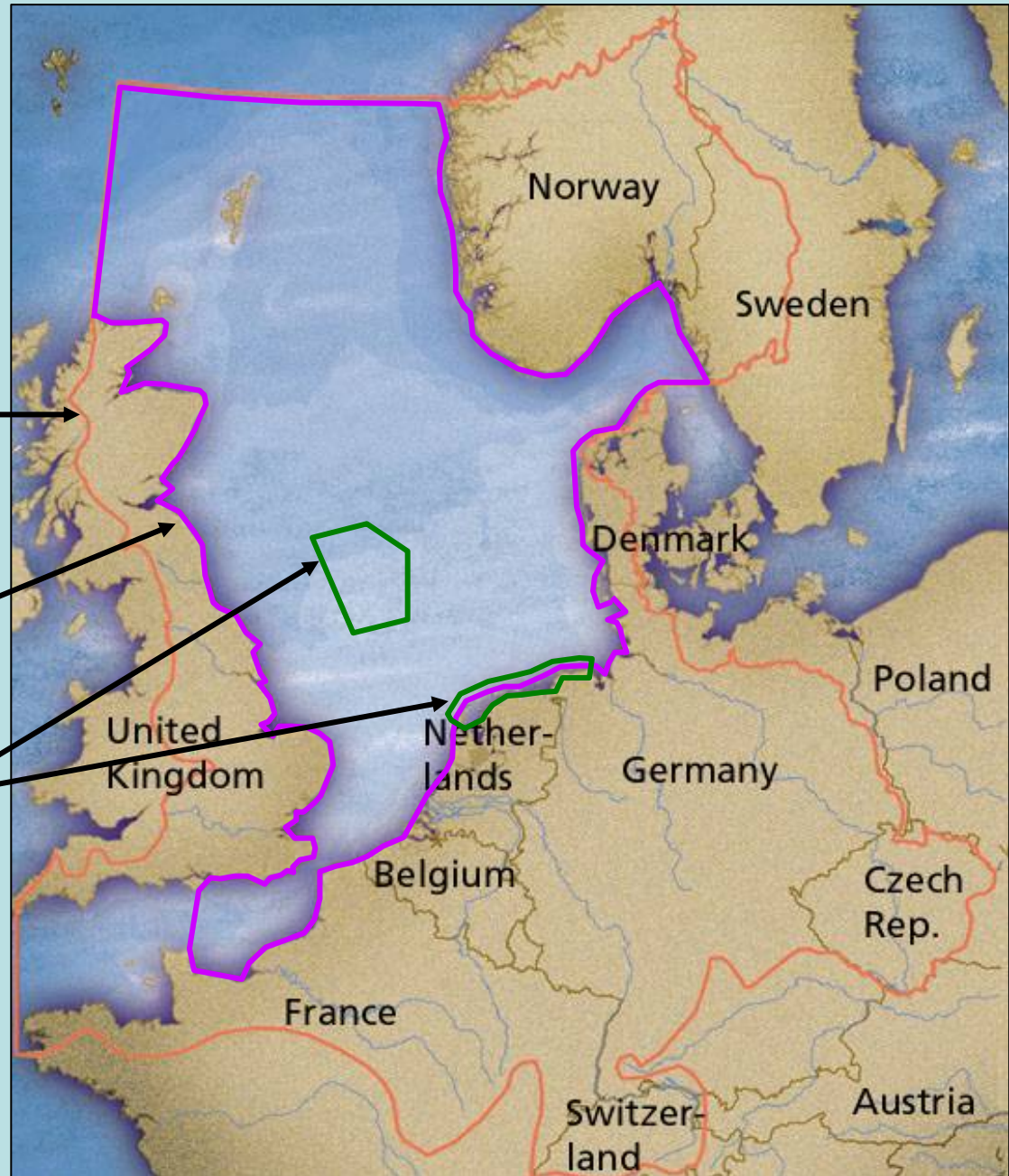
Evidence from the FP6 European Lifestyles and Marine Ecosystems (ELME) research project

1. Systems operate at varying scales

Scale for managing contaminant inputs

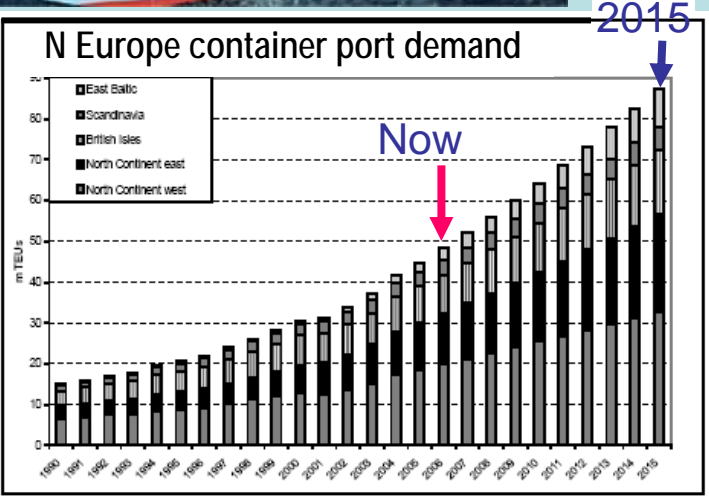
Scale for managing sea fisheries

Scale for managing distinctive sub-systems



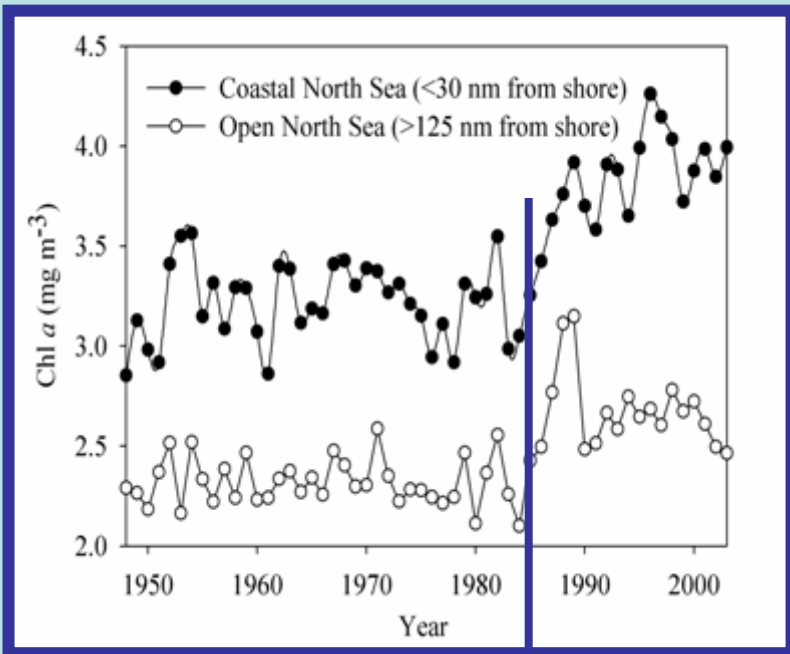
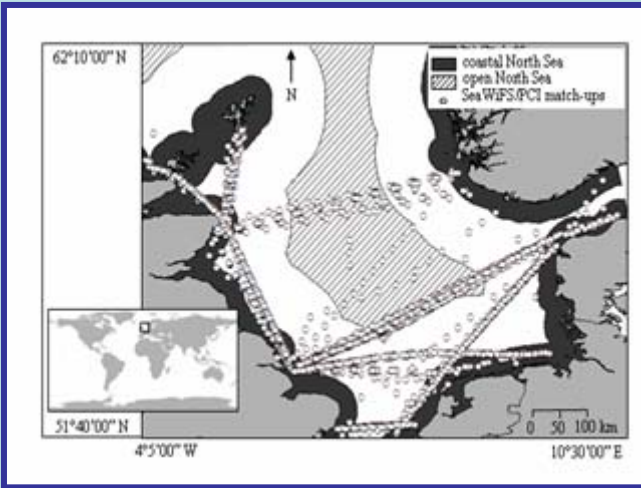
Note: These are examples and do not denote legal designations

2. Systems are interconnected

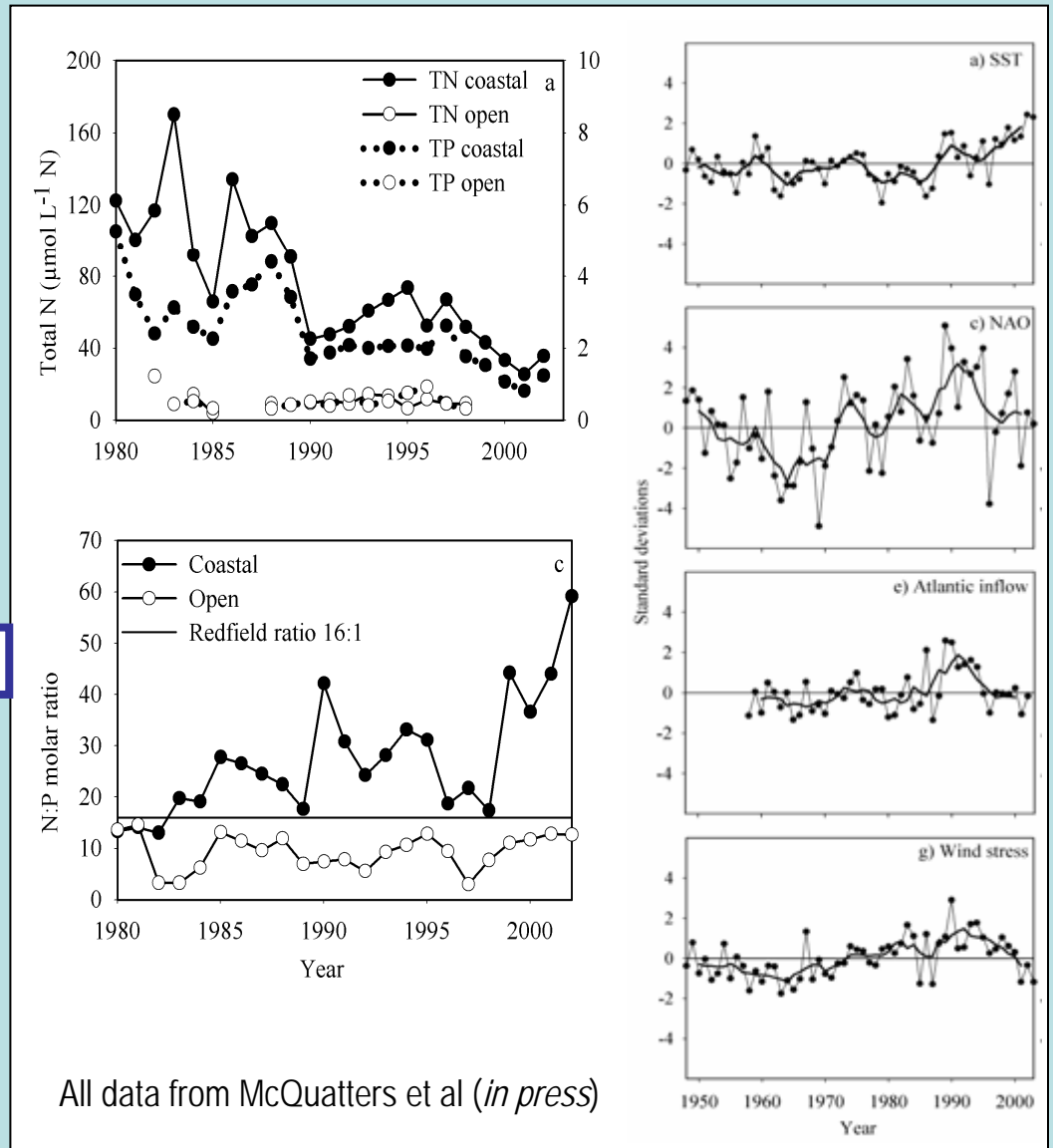


Data source:
Ocean
Shipping
Consultants
2006

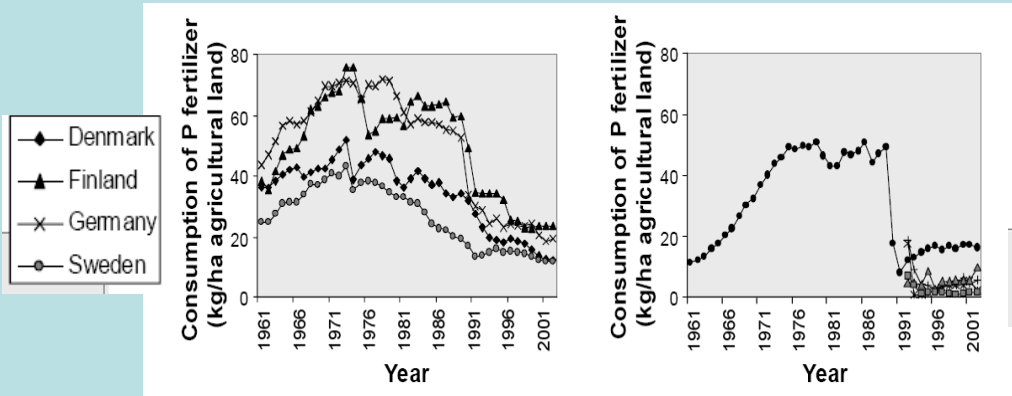
3. Systems demonstrate surprises (non-linearities)



Regime shift

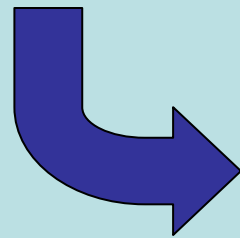


4. Systems have 'memories'

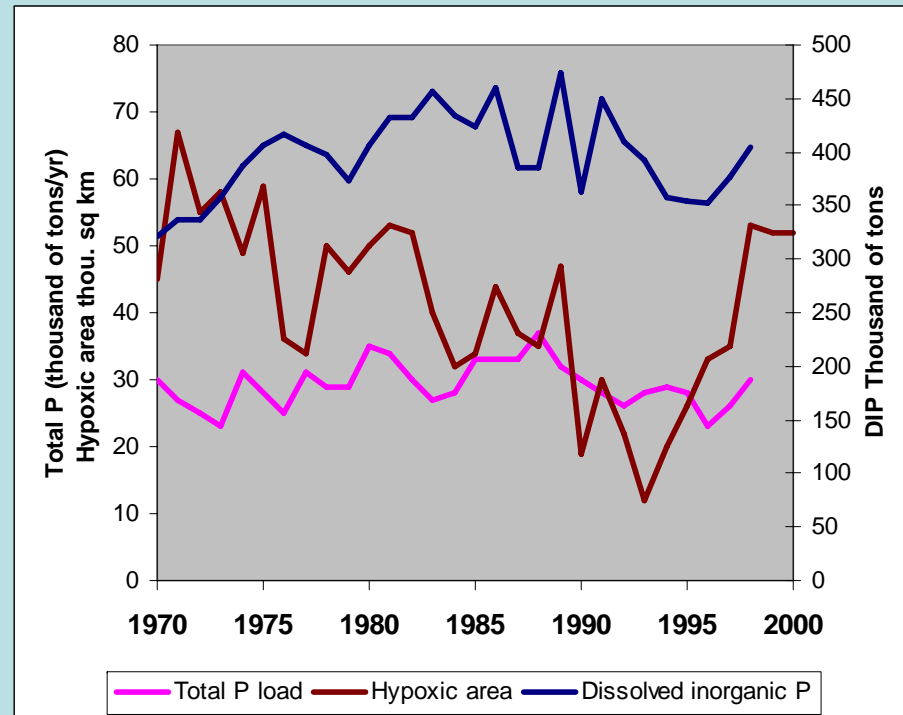


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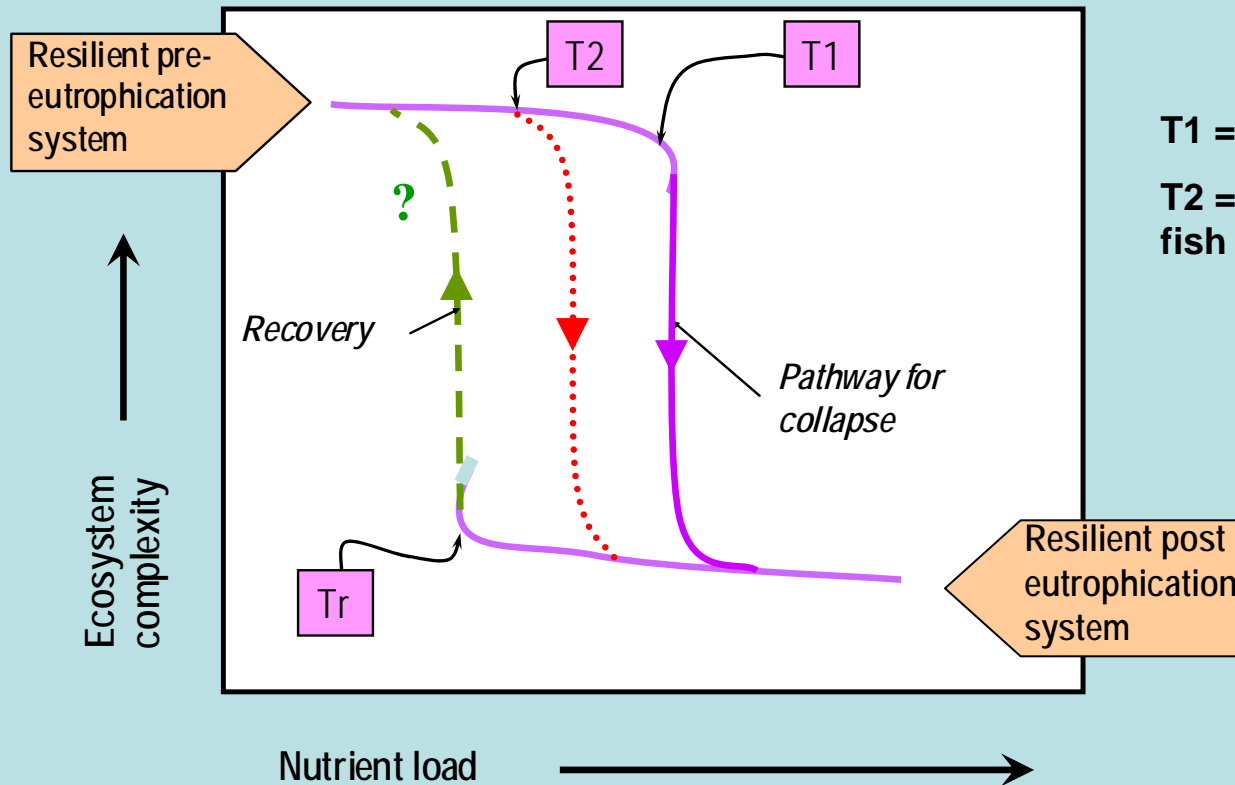
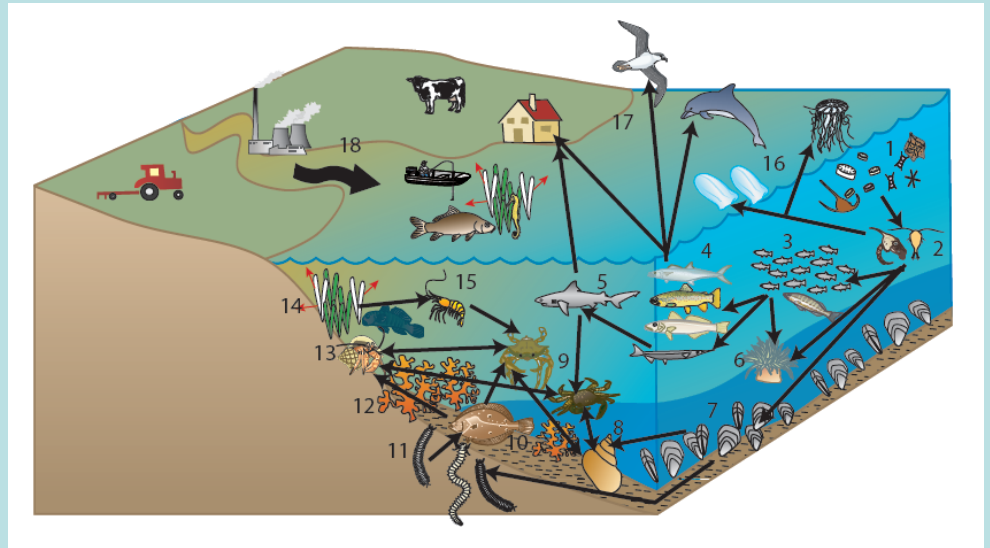
Large decrease in P consumption for agriculture



Small change in P load to system or dissolved P in system because of storage in catchment and sediments



5. Systems have emergent properties including resilience



T1 = Threshold of unaltered system

T2 = Threshold with removal of predator fish

6. Systems have choke points



The web of our life is of a mingled yarn, good and ill together.

SHAKESPEARE

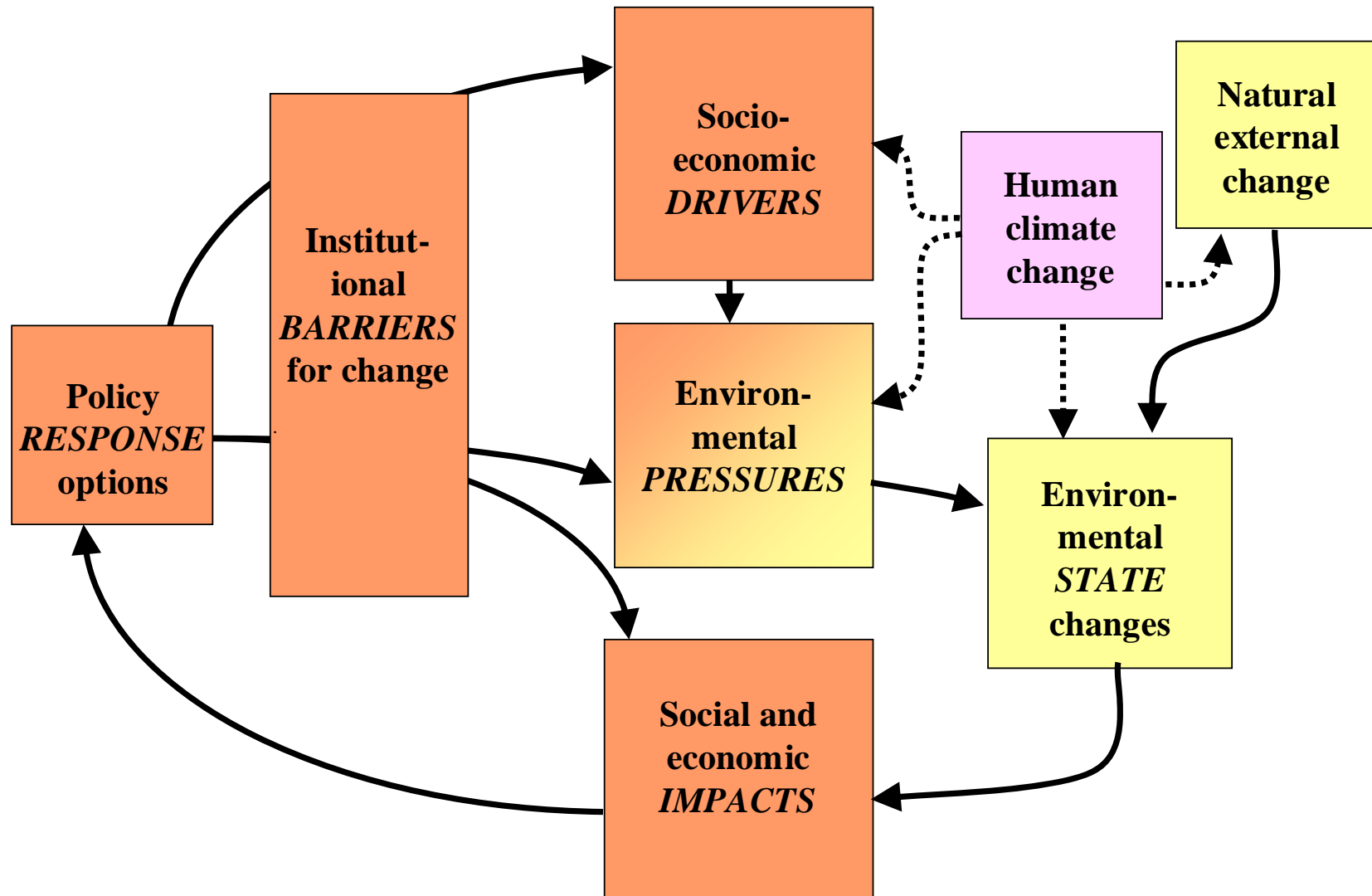
Key components of the ecosystem approach

- **Management objectives as societal choice**
- **Management decentralised and multi-sectoral**
- **Appropriate temporal and spatial scale**
- **Conservation of ecosystem function and resilience**
- **Appropriate balance between conservation and use**
- **Management within system limits**
- **The outward vision (respect interconnectedness) and long-term vision (change is inevitable)**
- **Broad use of knowledge, scientific and traditional**
- **Incorporation of economic considerations (costs and benefits, removal of externalities, etc.)**

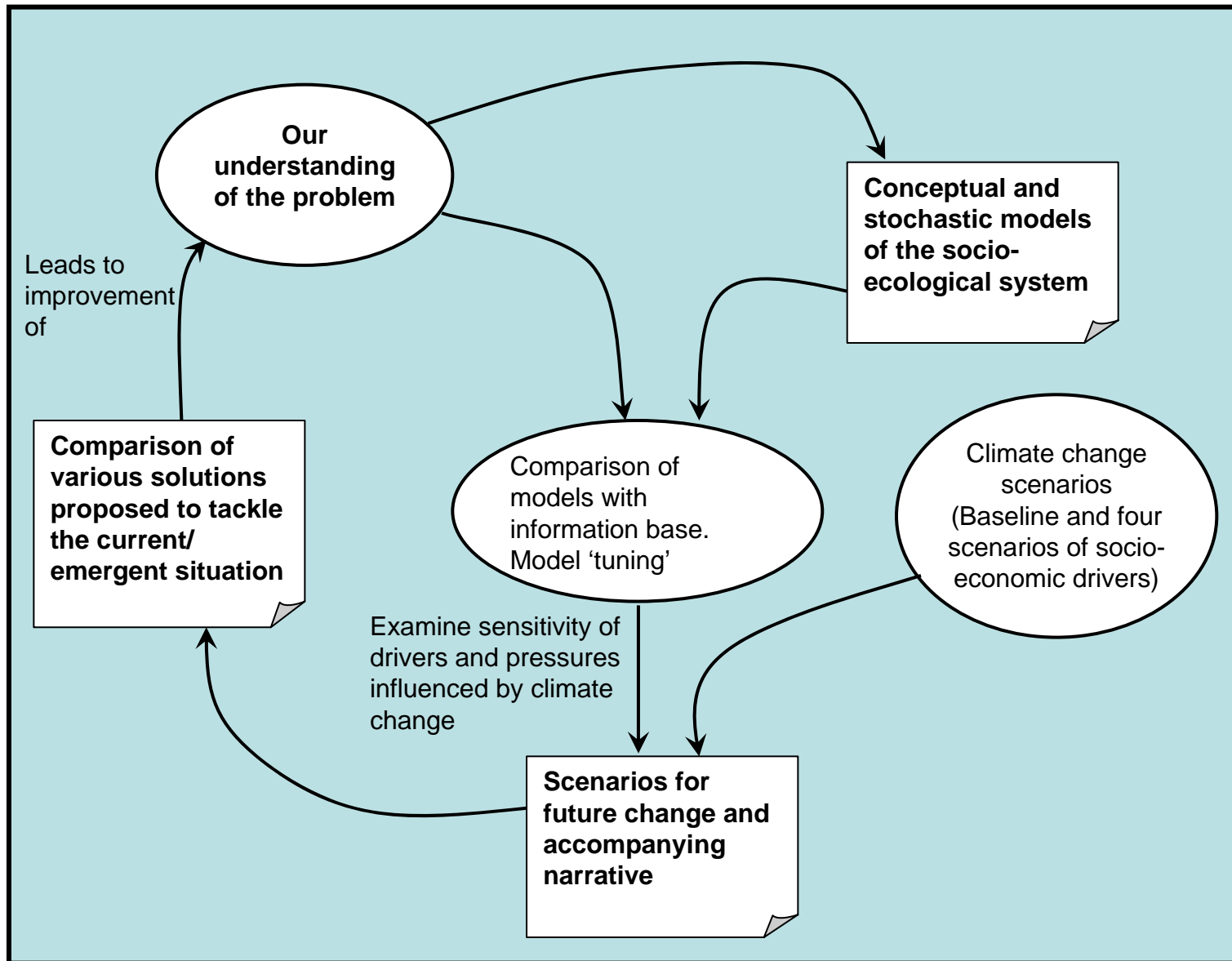
Source: CBD Malawi guidelines

**Our use of models for understanding
systems**

DPSIR model



How we use models



... but can we model social drivers of change?

Case studies of model applications



1. Mediterranean Seagrass

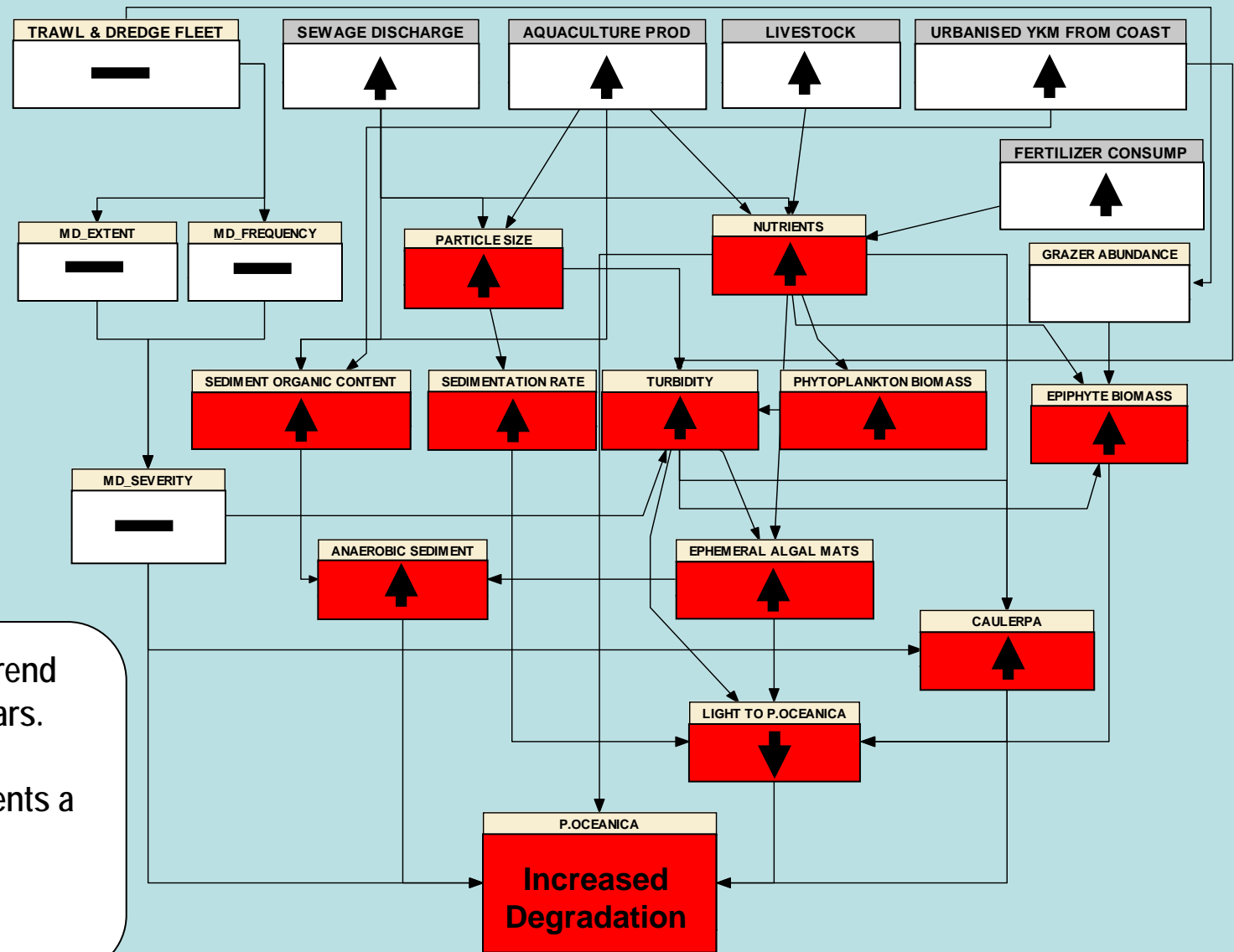
www.corbis.com

Consequence of 'Business as usual' for 25 years

Drivers

Pressures

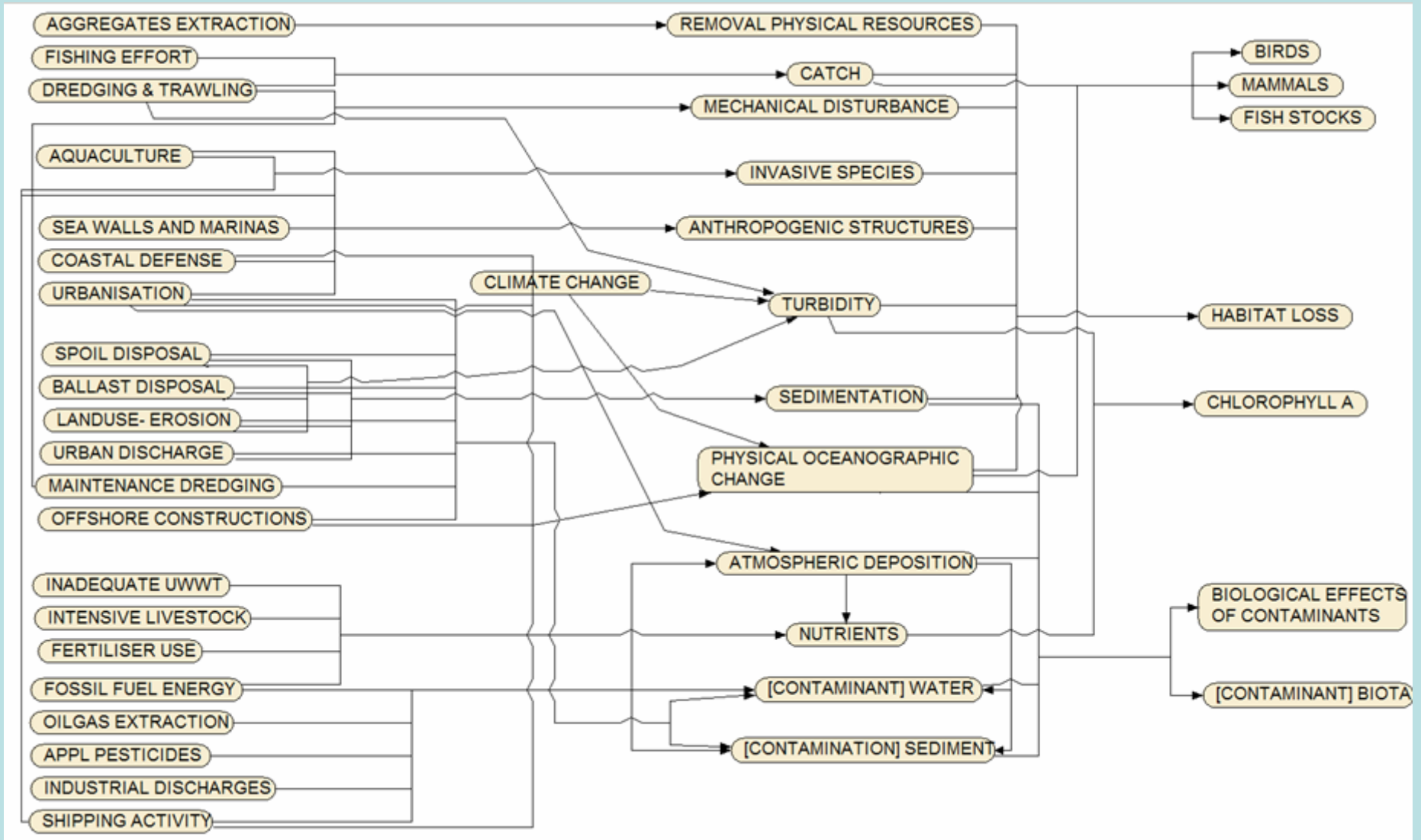
State changes



•Arrows show the trend over the next 25 years.

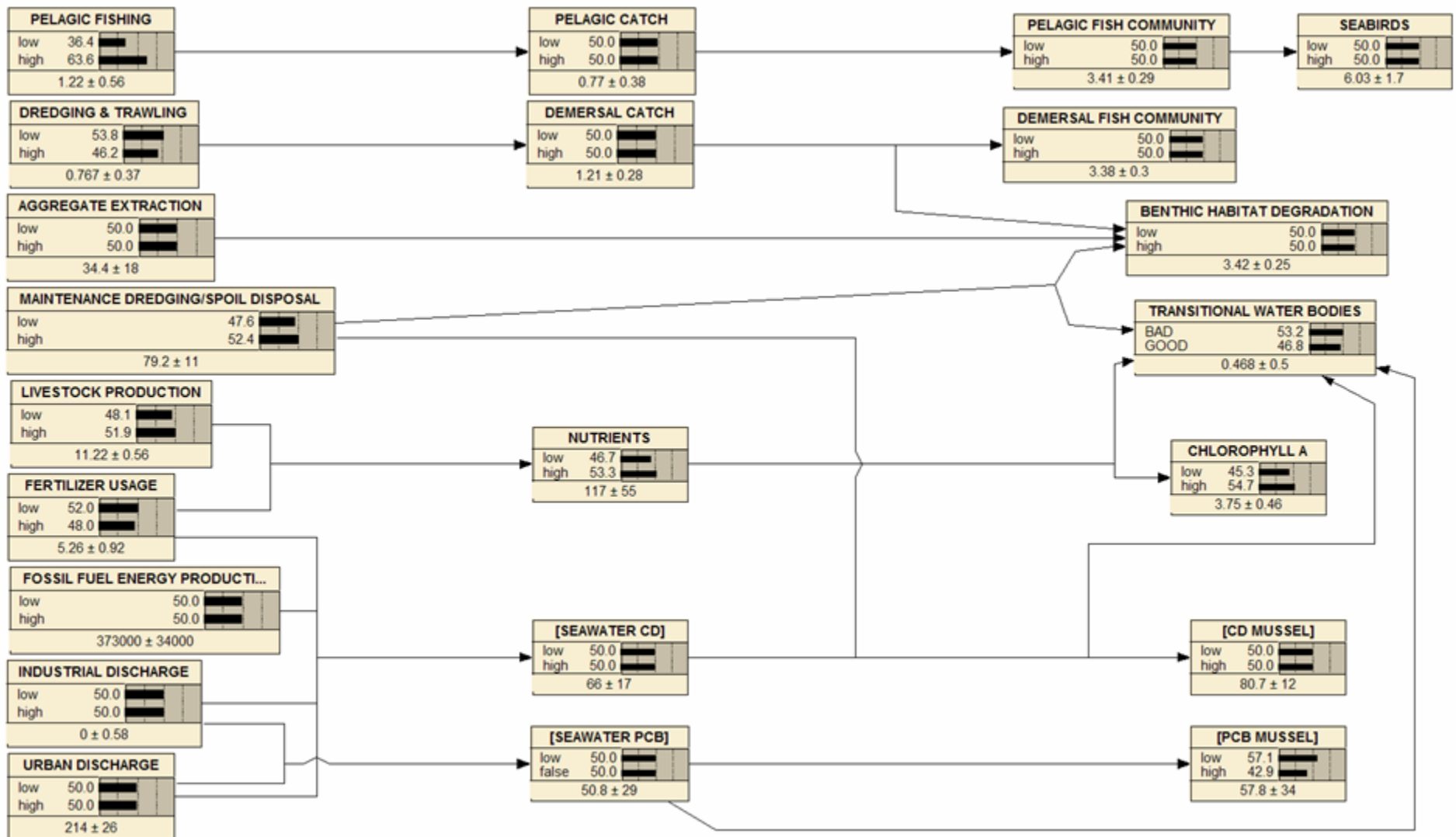
•Red colour represents a change which is detrimental to the environment.

2. Complexity of pressures: Regional scale conceptual model for the North East Atlantic



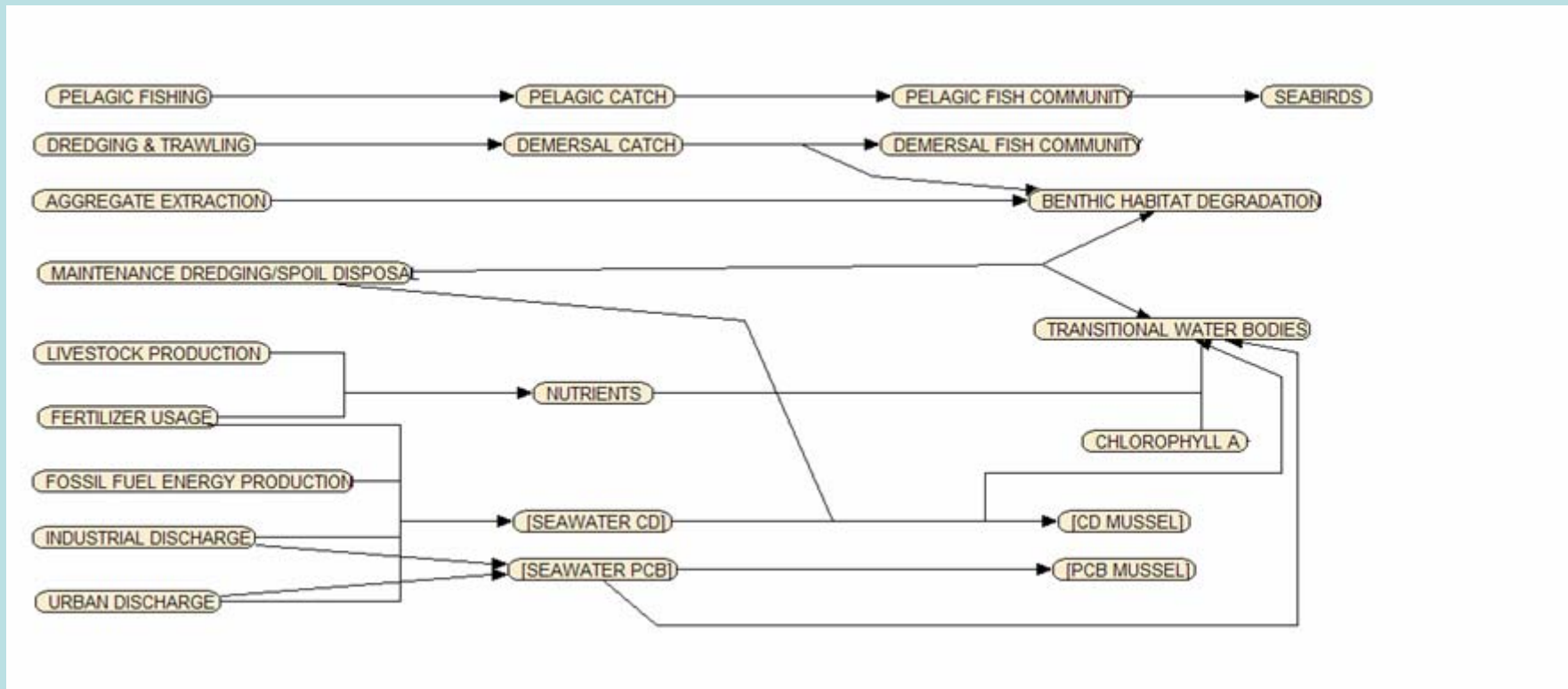
We need to understand the linkages to make meaningful management decisions

North East Atlantic Bayesian belief network



Huge data gaps and lack of reliable time series.

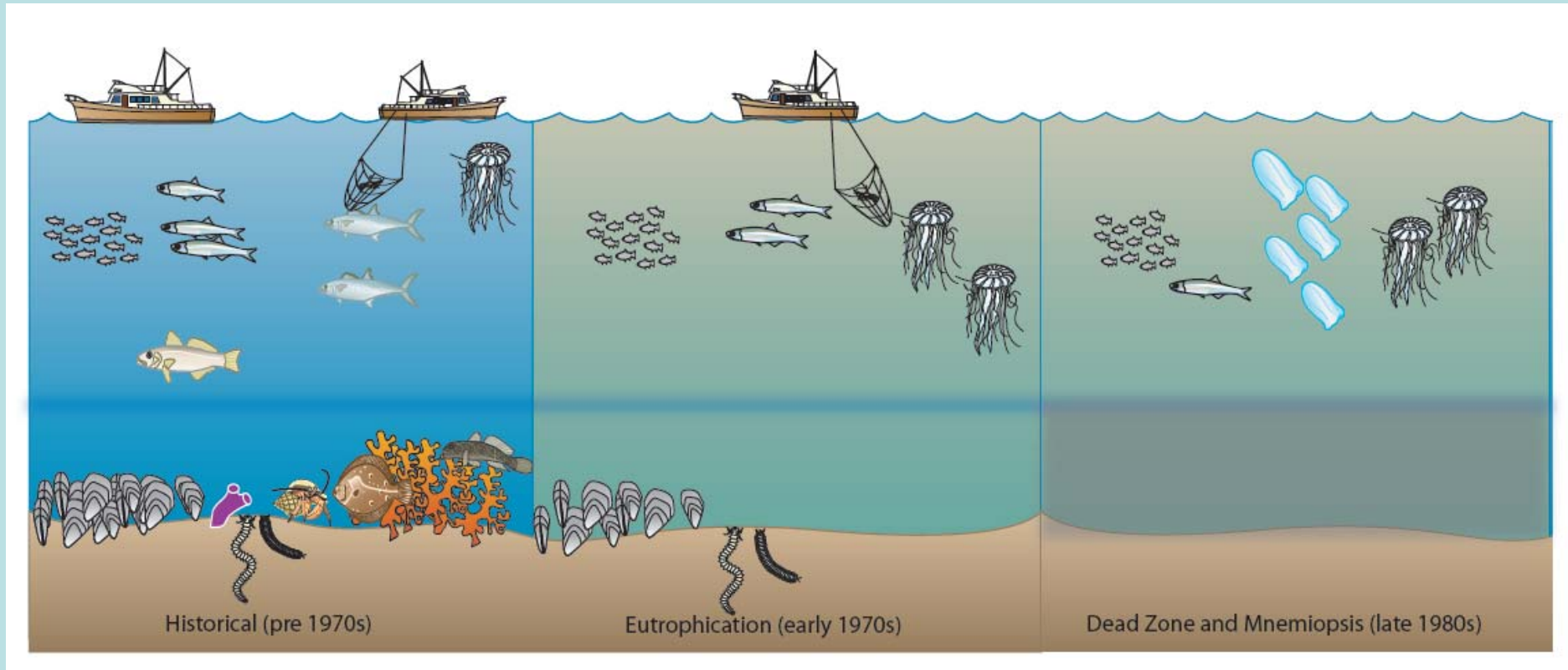
North East Atlantic Bayesian belief network



Simplification to focus on priority issues and to identify key indicators

Identifying and filling the gaps in understanding

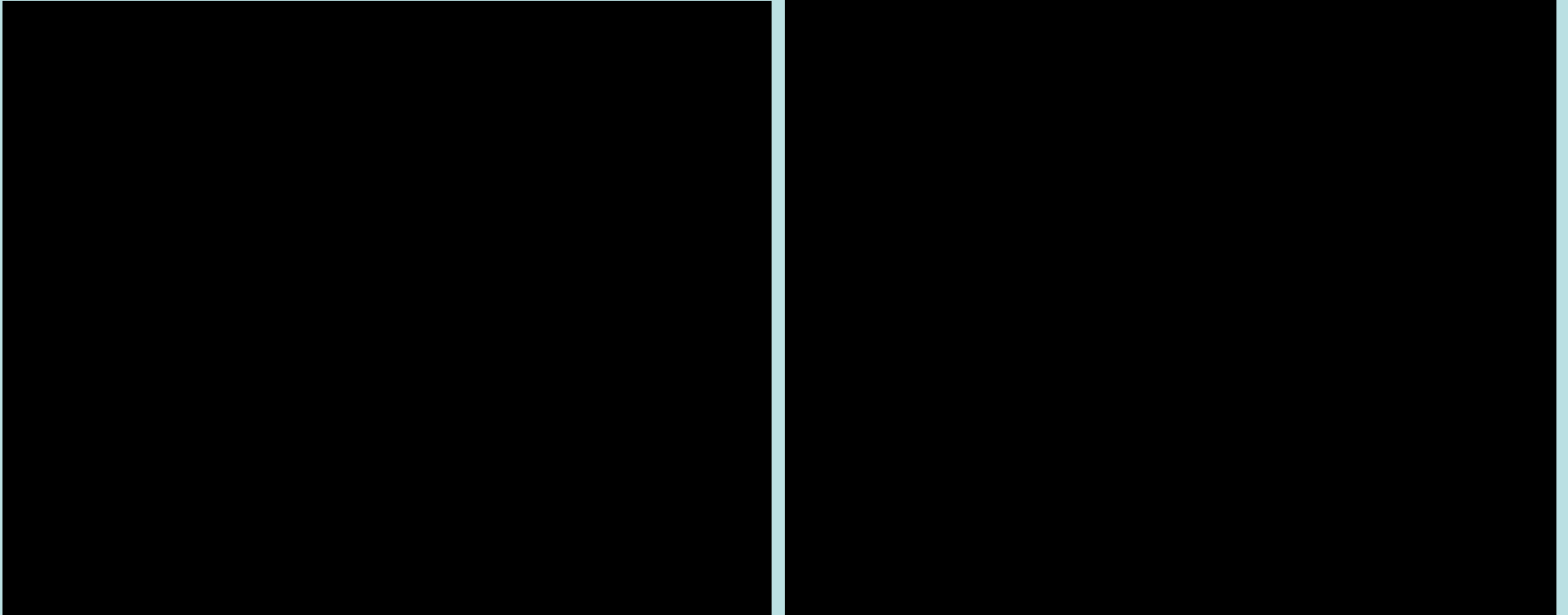
GES – An example from the Black Sea



Long term
objective
(EcoQO)

“to take measures to reduce the loads of nutrients and hazardous substances discharged to such levels necessary to permit Black Sea ecosystems to recover to conditions similar to those observed in the 1960s”

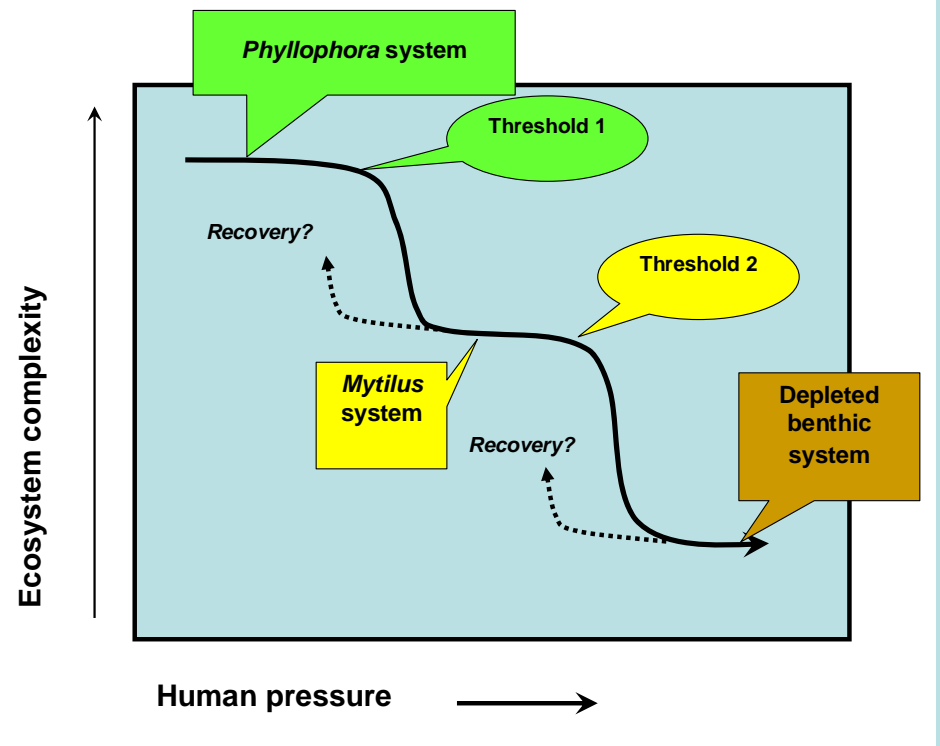
Images from August 2006 – R/V Akademik



"Goodness is easier to recognize than to define."

W.H. AUDEN

Thresholds – how do we know when we're getting close?



We need to maintain system resilience; but how to measure it?

The Birthday Cake

- Can you judge the quality of the cake entirely by the ingredients used?
- Are some ingredients more important than others?
- How do you compare today's cake with last years?



Key Tasks for the workshop

Work Package tasks

1. Understanding the uncertainties in our system models – to document the links in BBN models
2. What new knowledge has emerged from our work and how are we going to make the best use of it?

Regional Seas Tasks

1. Identification of knowledge gaps and uncertainties
2. Design of material for the final 'glossy' product

...and then

- Discussions on the final workshop and its significance
- Moving towards a proposal for FP7