



Ecosystem approach in Europe - integration of marine environmental policy and fisheries management

**MEFEPO Symposium
Brussels 3-4 october 2011**

**Poul Degnbol
Head of Advisory Programme
International Council for the Exploration of the Sea (ICES)**

New directions

- **Integrated approach to marine and maritime management**
- **Increasing focus on marine ecosystem health**
- **Within fisheries**
 - from avoiding disaster
 - to provision of services (economic, social, ecological)

Integrated maritime policy

- **Main interactions with fisheries:**
 - Environmental policy – MSFD, Habitats directive
 - Marine spatial planning
 - Coastal community development
- **Overall, fisheries is a minor maritime sector, competing for ecosystem services and space**



The EU Marine Strategy and fisheries measures

Marine strategy objectives

- **Achieve or maintain good environmental status in the marine environment by the year 2020 at the latest**
- **"good environmental status":**
 - **Healthy ecosystems: ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions**
 - **Sustainable use: the use of the marine environment is at a level that is sustainable, safeguarding the potential for uses and activities by current and future generations**

- (1) **Biological diversity** is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions.
- (2) **Non-indigenous species** introduced by human activities are at levels that do not adversely alter the ecosystems.
- (3) Populations of all **commercially exploited fish and shellfish** are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock.
- (4) All elements of the **marine food webs**, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive Capacity.
- (5) Human-induced **eutrophication** is minimised, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters.
- (6) **Sea-floor integrity** is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected.
- (7) Permanent alteration of **hydrographical conditions** does not adversely affect marine ecosystems.
- (8) Concentrations of **contaminants** are at levels not giving rise to pollution effects.
- (9) **Contaminants in fish and other seafood for human consumption** do not exceed levels established by Community legislation or other relevant standards.
- (10) Properties and quantities of **marine litter** do not cause harm to the coastal and marine environment.
- (11) Introduction of **energy, including underwater noise**, is at levels that do not adversely affect the marine environment.

Good Environmental status - important fisheries impacts

1. Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions.
3. Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock.
4. All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive Capacity.
6. Sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected.

Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions.

Biodiversity – fisheries measures

Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions.

- **Rebuild populations of commercially exploited fish populations**
- **Reduce or eliminate by-catches of non-target fish species, seabirds and sea mammals**
- **”in line with prevailing conditions” ????**

2 Non-indigenous species

Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems

In some cases (aquaculture) managed separately on community level

3. Commercially exploited fish and shellfish populations

Populations of all commercially exploited fish and shellfish are **within safe biological limits**, exhibiting a population age and size distribution that is indicative of a healthy stock.

3. Commercially exploited fish and shellfish populations

Populations of all **commercially exploited fish and shellfish** are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock.

Criteria	Indicators to be measured
Level of pressure of the fishing activity	Fishing mortality (F equal to or lower than F_{MSY}) If F not available: ratio catch/biomass
Reproductive capacity	Spawning stock biomass at or larger than SSB_{MSY} (or biomass indices if not available)
Age and size composition	Proportion of fish larger than size of first maturity Mean maximum length across all species found in research vessel surveys 95% percentile of fish length distribution observed in research vessel surveys Secondary: size at first sexual maturity (genetic effects)

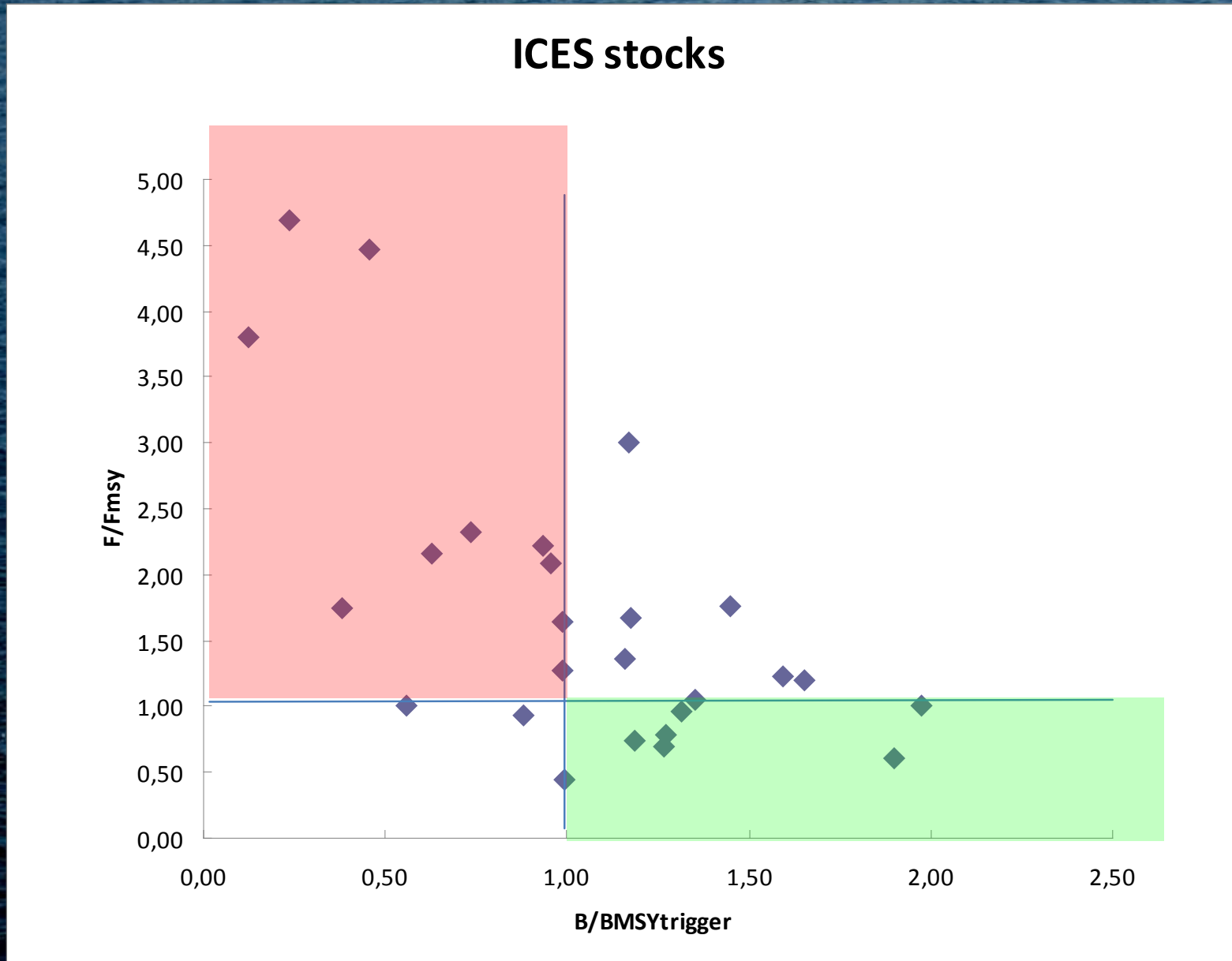
Changing concept of fisheries sustainability

- **From avoiding something bad**
 - **Precautionary approach – safe biological limits**
- **To avoiding something bad AND rebuild marine ecosystems**
 - **Maximum Sustainable Yield (MSY) with precaution about population sizes**

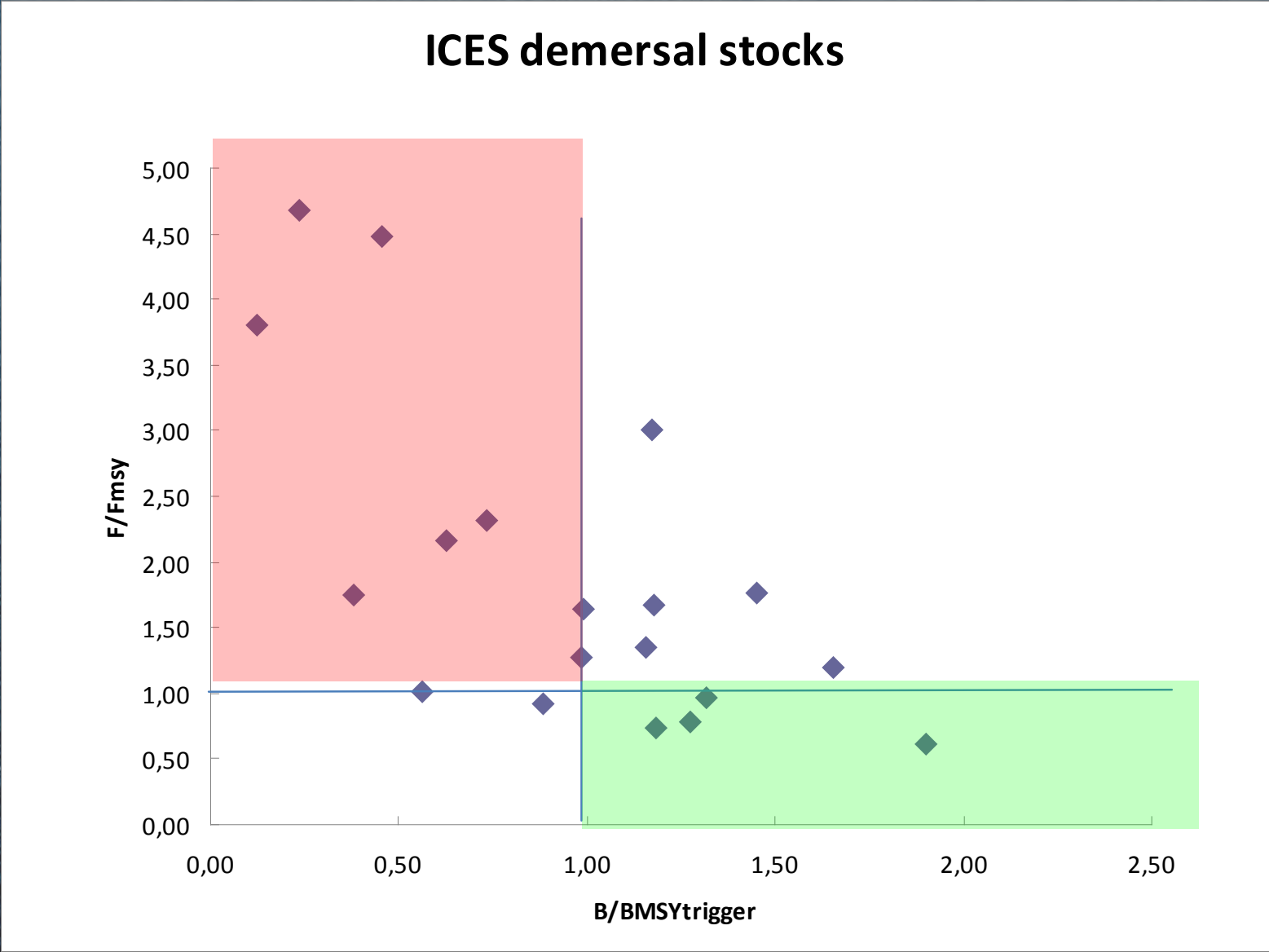
Maximum Sustainable Yield

- **Maintaining (or rebuilding) stocks at high productivity**
 - **Reduce fishing pressure**
 - **Safeguard minimum population sizes**
 - **An thereby**
 - **Rebuilding marine ecosystems (from a state of overexploitation)**
 - **Delivering services to society (food and economic benefits)**

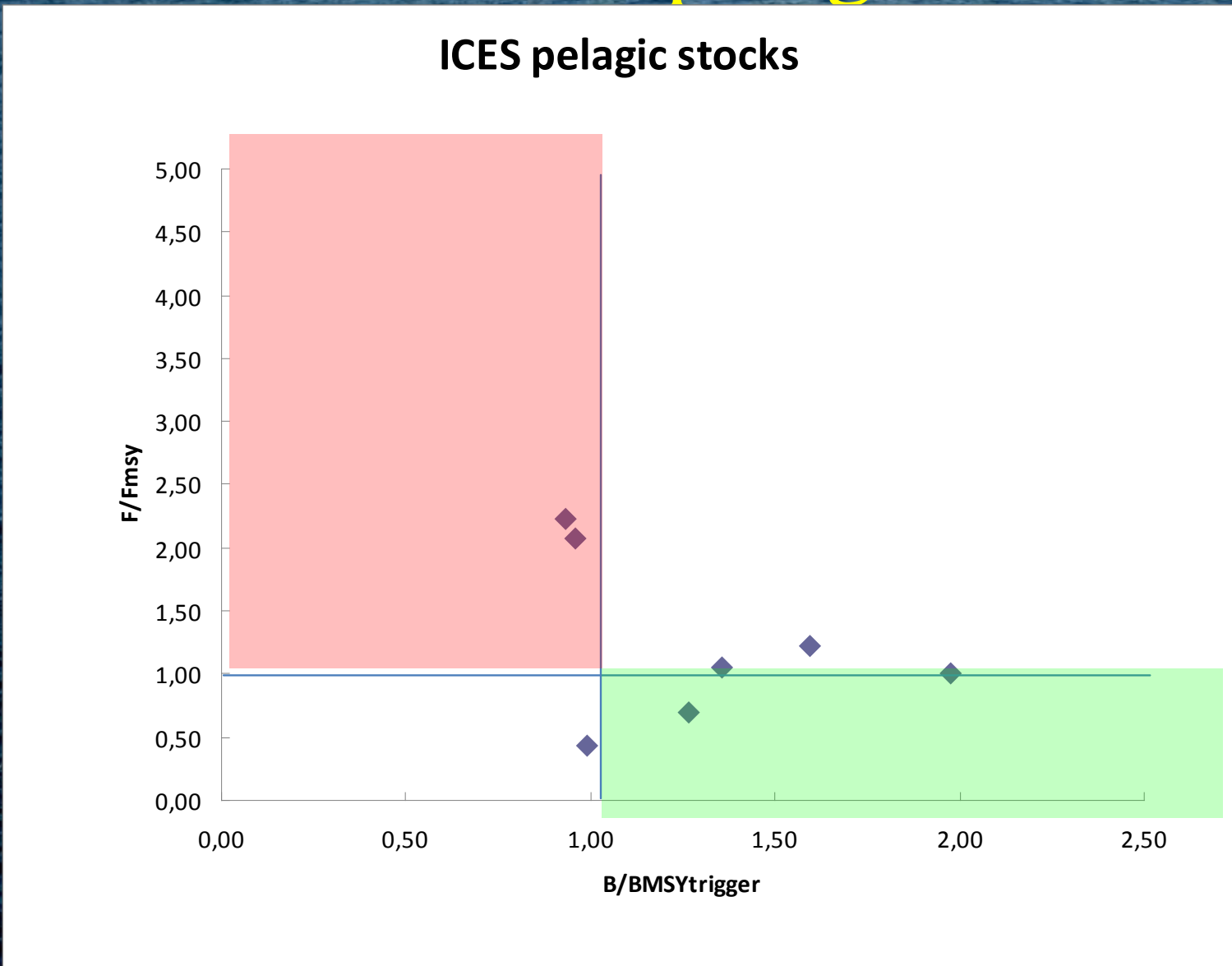
State of stocks



State of demersal stocks



State of pelagic stocks



Presently MSY most important single measure for an ecosystem approach

- Fishing mortality is well above F_{MSY} in most fisheries
- In many fisheries present F is 2-3 times F_{MSY}
- Reducing F to F_{MSY} will also
 - Rebuild fish populations
 - Reduce bycatches of other sealife
 - Reduce impacts on bottom habitats
 - Reduce impacts on biodiversity and ecosystem health

All elements of the marine **food webs**, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive Capacity.

Food webs – fisheries measures

All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive Capacity.

- **Avoid by-catches of non-target sealife**
- **Maintain minimum stock of fish low in food chain**
- **Ecosystem engineering - "balanced fishing"
????**
 - **Is there such a thing as "normal" abundance and diversity?**



6. Sea floor integrity – fisheries measures

Sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected.

- **Low-impact (low-contact) fishing gear**

Tensions of scale and competence

Environment
MSFD, Habitats

Fisheries
CFP

Frame Directive



EU

Regional sea

?

EEZ



Member states

EU

Regional sea

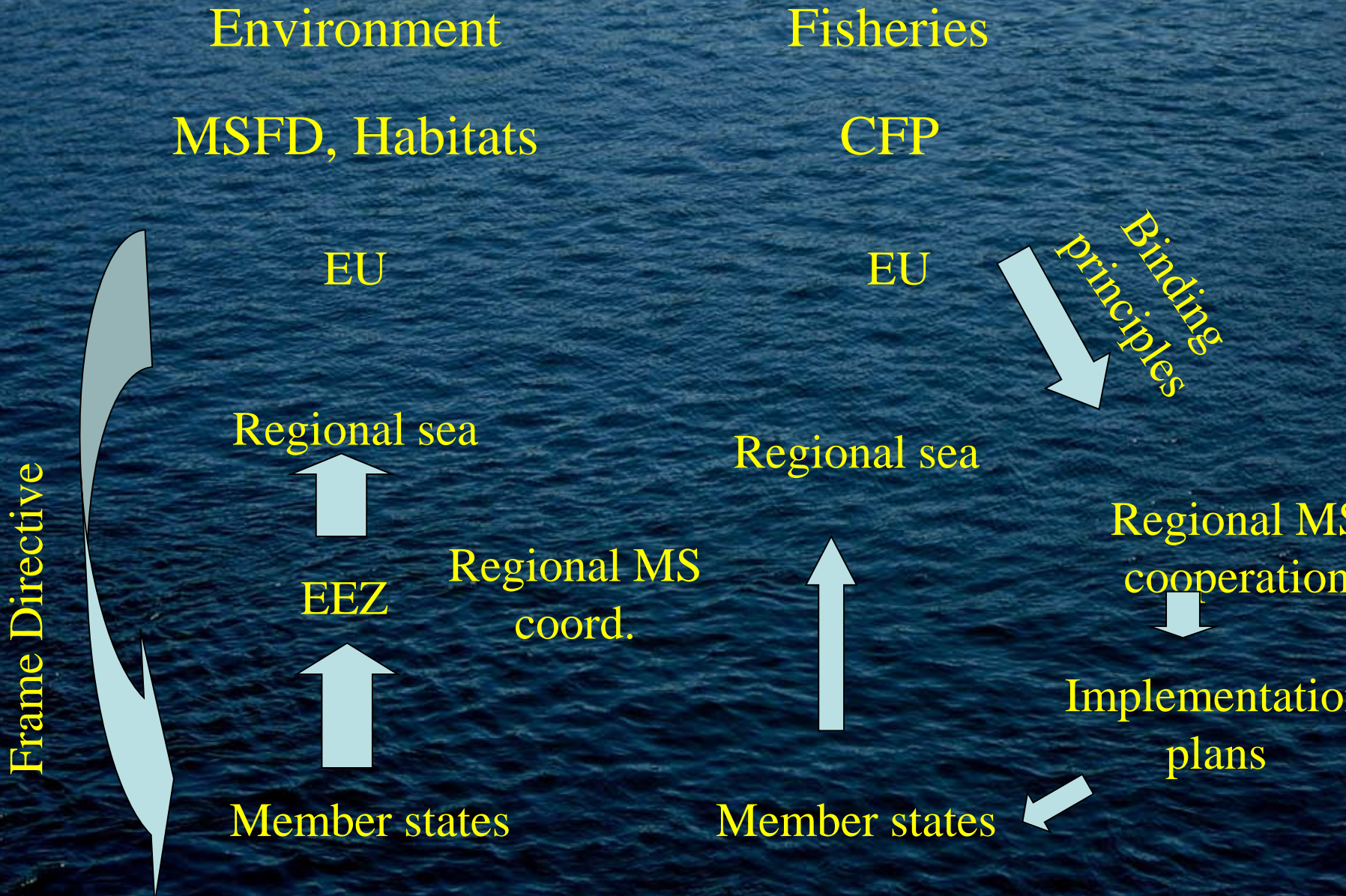


Member states

Binding legislation



Regional resolution





Data and
assessments

Data

- **Data on fish stocks are collected on a regular basis through internationally coordinated surveys**
- **Most surveys in NE Atlantic coordinated by ICES**
- **EU – countries: minimum criteria established in Data Collection Framework. (Surveys, catches, logbooks, VMS)**

DCF includes obligation to collect data
for a set of indicators regarding the
ecosystem impacts of fisheries

Data support

- **MSFD Indicators require data and time series of data**
- **There is a data collection system in place to support CFP implementation**
 - **Data Collection Framework (Council reg 199/2008, 665/2008; Com decision 2008/949) – including R/V surveys and fisheries data, economic and social data**
 - **Implementation regulation (2008/949, Appendix XIII) defines 9 indicators for the ecosystem impacts of fisheries**
- **No framework for other MSFD data**

DCF indicators

Environmental indicators to measure the impacts of fisheries on marine ecosystems

- 1 Conservation status of fish
- 2 Proportion of large fish
- 3 Mean maximum length of fishes
- 4 Size at maturation of exploited fish species
- 5 Distribution of fishing activities
- 6 Aggregation of fishing activities
- 7 Areas not impacted by mobile bottom gears
- 8 Discarding rates of commercially exploited species
- 9 Fuel efficiency of fish capture

Contributes to MSFD descriptor 1 (biodiversity), 2 (food webs), 3 (fish stocks), 6 (sea floor integrity)

BUT – important biota and parameters are not included

Data access

- **DCF data are basically public domain**
- **Formal limits to certain 'end users' and for specific purposes**
- **All users providing scientific advice, making scientific analysis, informing the policy debate can request data from the DCF**
- **Moratorium dependent on purpose – for scientific publication 3 years**

- **Change basis for fisheries advice towards MSY framework**
 - 2011-1012: framework for MSY advice for 'data poor stocks'
 - D3+: establish 'best available science' for framework for assessments, indicators and targets regarding 'descriptor 3' in MSFD
- **Incorporate fisheries and species interactions**
 - 2012 – advice including fisheries interactions case (north sea) and species interactions case (Baltic)
- **Incorporate ecosystem effects of fishing in advice as knowledge comes forward**
 - Incidental bycatches (elasmobranchs, seabirds, mammals)
 - Habitat impacts (corals, building VMS data bases)
 - Impacts on biodiversity and food webs

The D3+ process

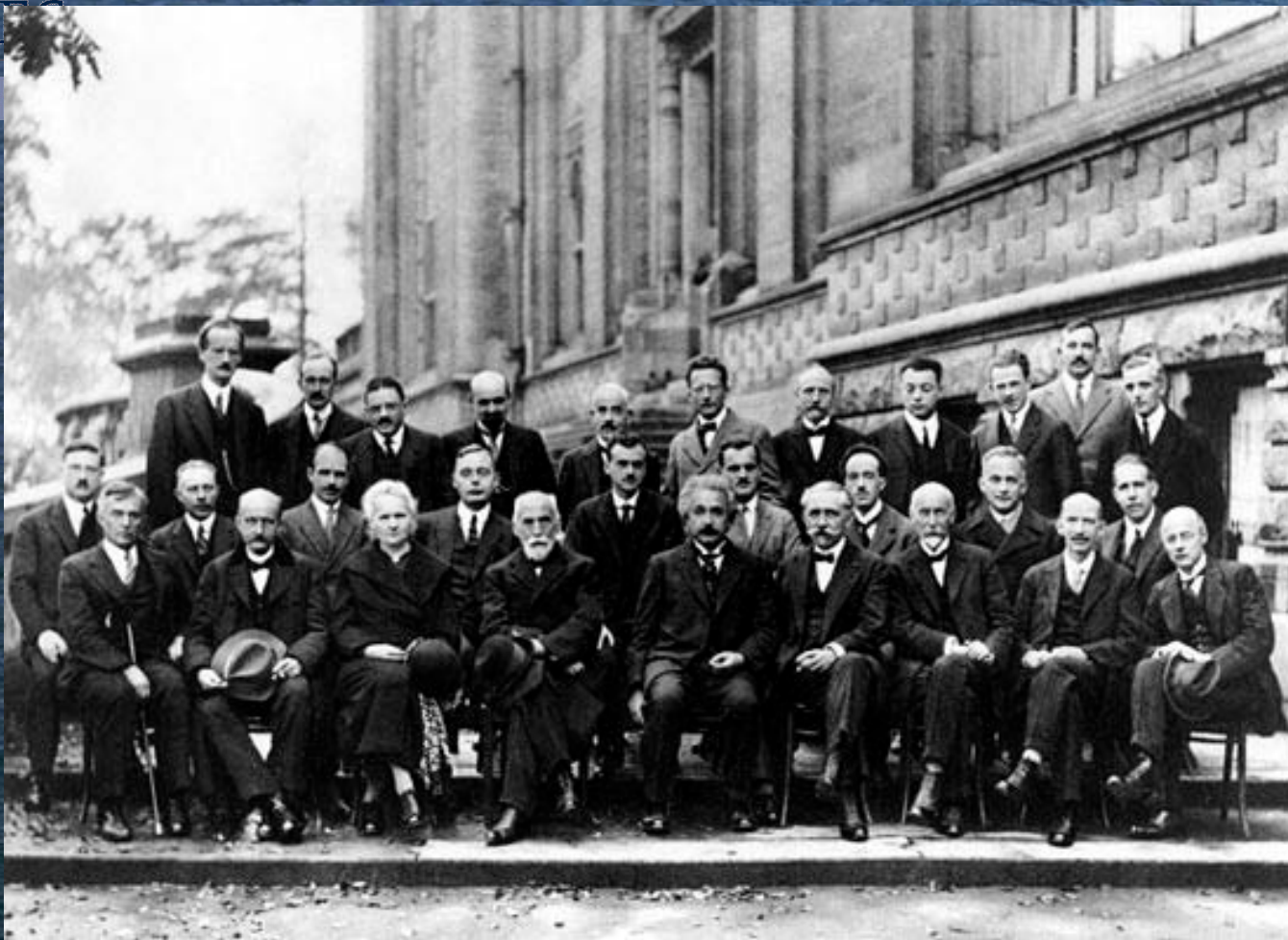
- Need for ecoregion approach regarding fish populations
- Provide report on best available science to establish indicators and assessments regard D3 – at disposal for competent authorities to use or not
- Incorporate aspects regarding fish populations informing D1, D4, D6
- Provide proposal for core set of indicators of ICES ecosystem overviews re fish stocks
- International DXX processes?

Challenges

- **Develop regional cooperation to**
 - **Develop and implement coherent approach to MSFD**
 - **Develop CFP implementation platform**
 - **Ensure that fisheries measures required to meet MSFD objectives are decided and implemented through the CFP**
- **In dialogue across region between authorities and stakeholders**
- **Develop framework for regional data collection and analysis for indicator monitoring and GES assessment**



Are we op to it?



**Picard, E. Henriot, P. Ehrenfest, , Th. De Donder, E. Schrödinger, J.E. Verschaffelt, W. Pauli, W. Heisenberg,
R.H. Fowler, L. Brillouin;**

P. Debye, M. Knudsen, W.L. Bragg, H.A. Kramers, P.A.M. Dirac, A.H. Compton, L. de Broglie, M. Born, N. Bohr;

I. Langmuir, M. Planck, M. Curie, H.A. Lorentz, A. Einstein, P. Langevin, , C.T.R. Wilson, O.W. Richardson

