Addressing uncertainty in fisheries management through participatory modelling

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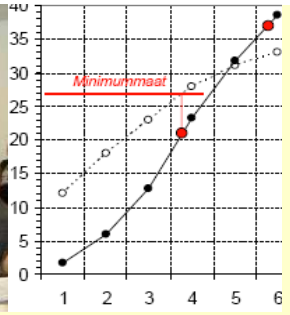

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Christine Röckmann (presenter)
Kjellrun Hiis Hauge, Clara Ulrich, Ewen Bell, George Tserpes, Päivi Haapasaari, Samu Mäntyniemi, Marion Dreyer, Daniel Howell, Edward Borodzicz, Martin Pastoors

SEVENTH FRAMEWORK PROGRAMME

JAKFISH
Judgement and Knowledge in Fisheries Involving Stakeholders

Östersund, March 2011

Judgement **A**nd **K**nowledge in **F**isheries **I**nvolving **S**takeholders

JAKFISH
Judgement and Knowledge in Fisheries Involving Stakeholders

– the interdisciplinary project team –

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The Centre for Environment, Fisheries & Aquaculture Science

IFM
INNOVATIVE FISHERIES MANAGEMENT
- an Aalborg University Research Centre

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DTU Aqua
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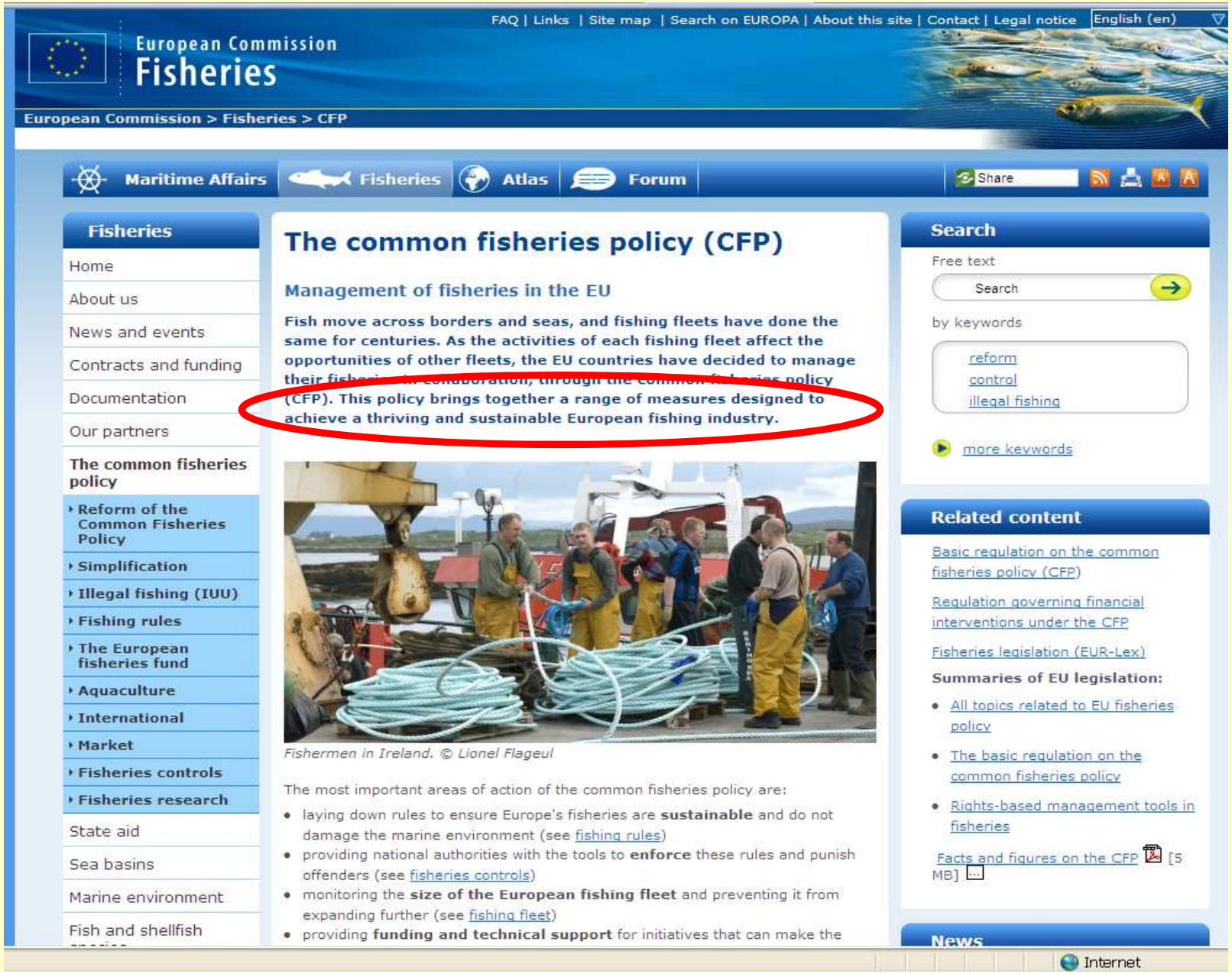
Outline

1. **“problem diagnosis”**
   Brief background on fisheries management in Europe

2. **"JAKFISH exploratory approach"**
   idea and intention of the JAKFISH project

3. **"insights gained“**
   Conclusions from participatory modelling

Fisheries management in the EU



Uncertainties in fisheries

- You cannot easily count fish (neither alive nor dead)

- What is a sustainable fishery?
- How to prioritise different objectives – ecological, but also economic and social?
- Given high uncertainties and high stakes, what risk (e.g. of stock collapse) is society willing to take?

- Does the scientific method fit the policy problem?
- What are the scientific assumptions, and do they potentially favour certain values at stake?

➔ CONFLICTS

Conflicts and problem diagnosis

- Mistrust due to differing perceptions between scientists and fishers of how many fish there are in the sea
- Illegal fishing, black landings

➔ **Inefficiency of policies and management measures**

➔ **lack of legitimacy of management decisions and underlying policies**

Driver and idea

Policy driver:

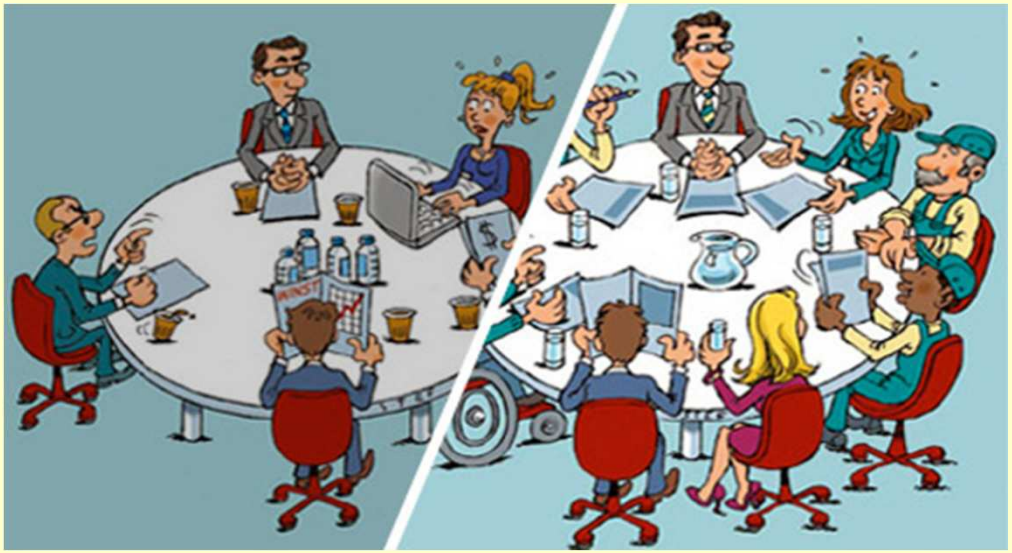
Reform of the CFP

➔ Improve the quality of management decisions through **PARTICIPATION** → involving stakeholders

- ✓ **openness and transparency (wrt uncertainty, model assumptions, ...)**
- ✓ **including stakeholders' knowledge and interests to improve the knowledge base**

➔ basis for building up **trust, support, ownership, legitimacy**

exploratory approach



➔ Participatory modelling

- emerging field

Start/ Basis:

- Review of participatory methods
- Findings of participatory approaches in river-basin and forest management
- Simulation (role play) development to confront stakeholders with each others' realities

Stakeholders

Regional Advisory Councils (RACs):
stakeholder-led organisations: representatives of the fisheries sector and other interest groups (e.g. NGOs)

Stakeholder input at various stages:

- Problem framing
- Scenario development
- Evaluation / Commenting on
  - data used
  - Ecosystem interactions
  - Uncertainties, Risks
  - Scenarios
  - Results

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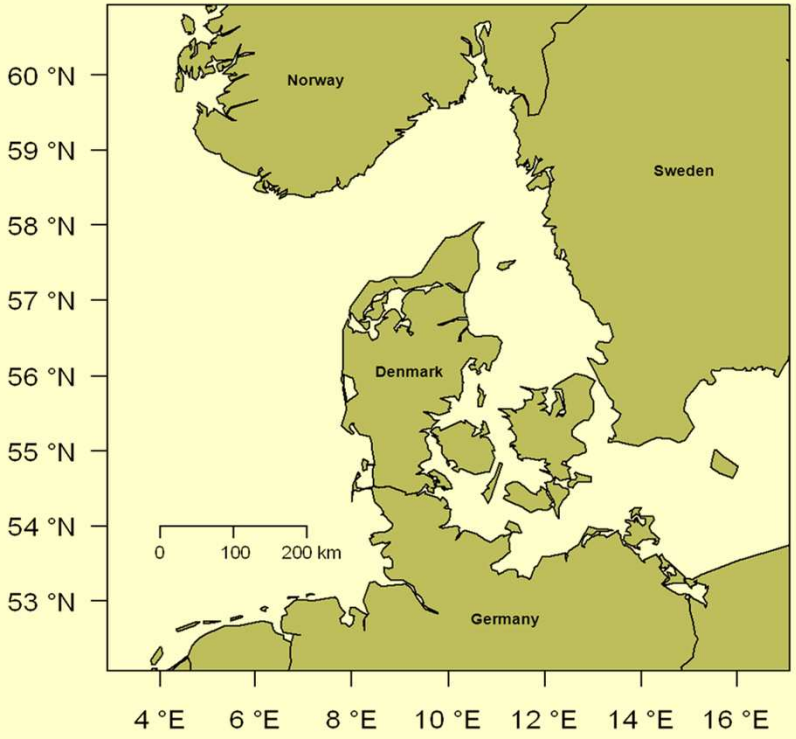
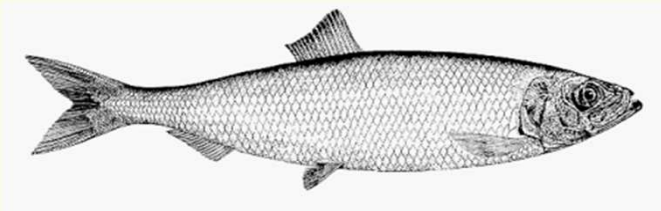
One case study approach

- **Western Baltic Spring Spawning herring**





Clara Ulrich, A. Coers, K.H. Hauge, L.W. Clausen, C. Olesen, L. Fisher, R. Johansson, M.R. Payne

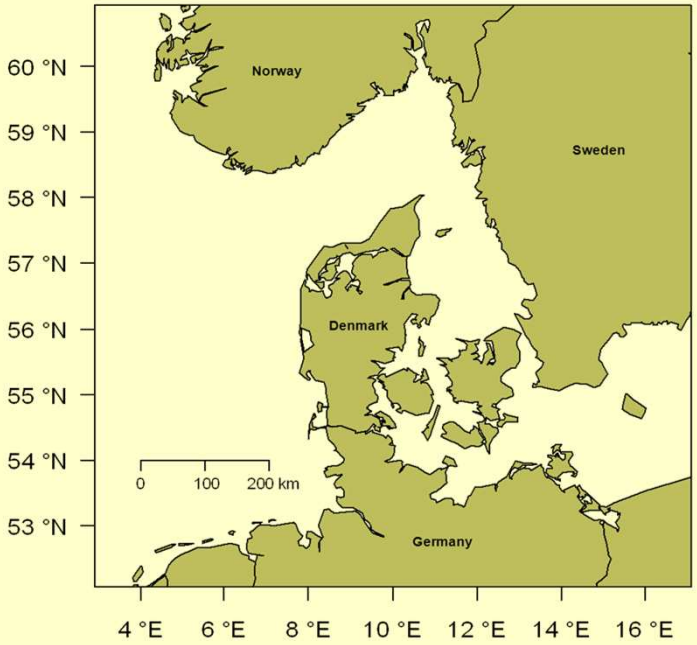
Pelagic RAC

baltic sea RAC

SMALL STOCK, BIG PROBLEMS!

Biological and stock assessment issues

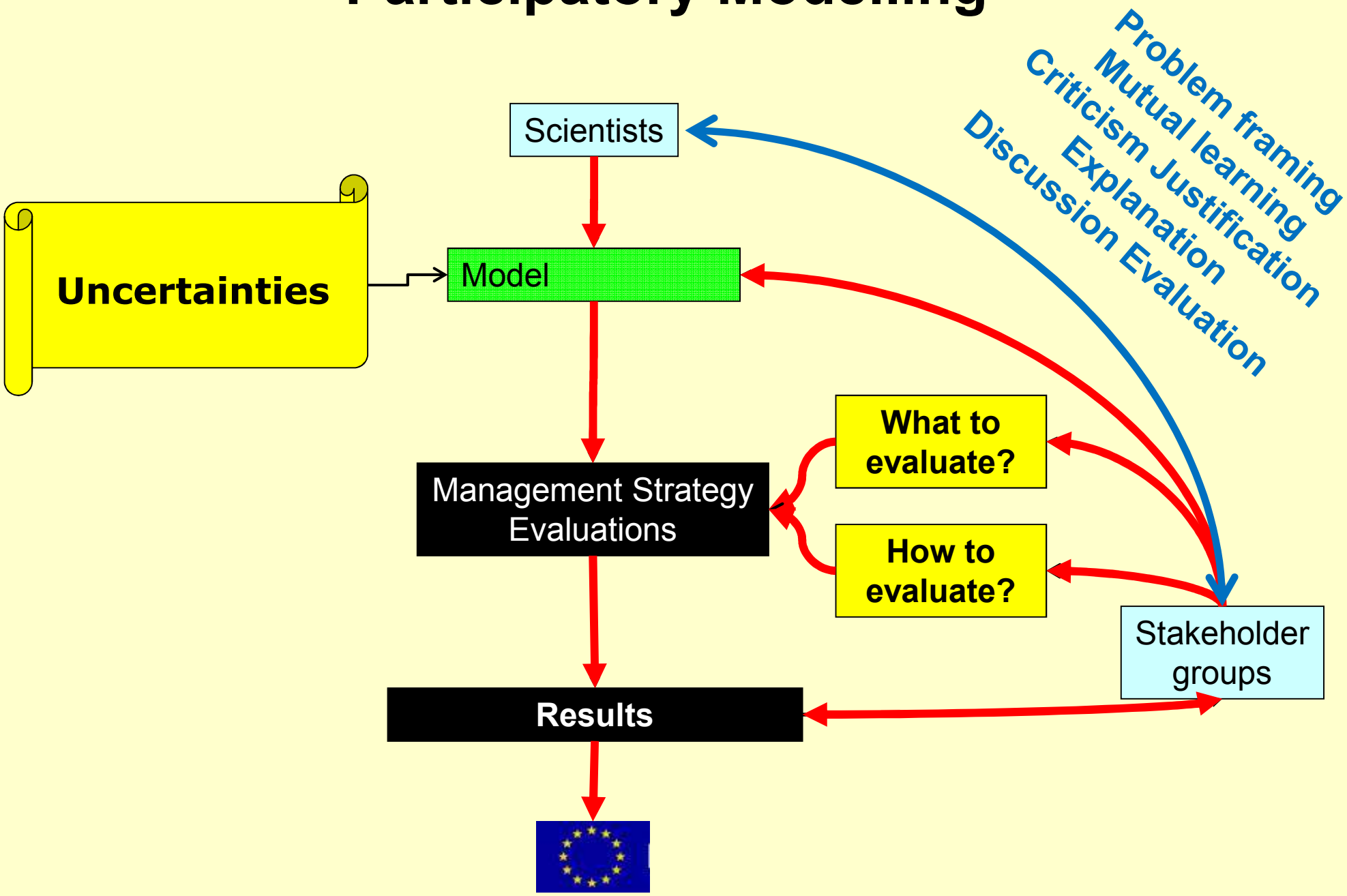
- Lack of biological knowledge
- Model uncertainties
- Scientific advice contested by stakeholders



Political issues

- 4 countries,
- 4 fleets,
- 2 Regional Advisory Councils
- EC initiative: proposal for the establishment of a long term management plan

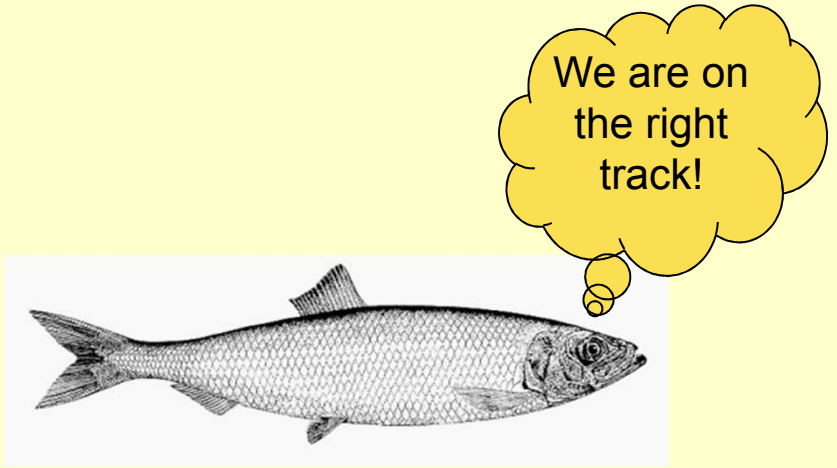
Participatory Modelling



Case study lessons learned

- Disagreement with a previous scientific suggestions for a management approach
- Agreement on a new solution, facilitated through the JAKFISH's participatory work
- Still unresolved issues and differences in interpretation
- Have we improved the year-to year management?

- The science base is
  - ✓Communicated
  - ✓Understood
  - ✓Accepted (~)
- The result
  - ✓Agreed
  - ✓Supported



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Commonalities between case studies

- Unsustainable fisheries
- High uncertainties
- Conflicts due to scarce resources, different interpretation about the resource situation
- Potential to benefit from scientific modelling to explore management options

➔ JAKFISH helped stakeholders develop and evaluate management options

➔ assessment of epistemic uncertainties

➔ stakeholder evaluation of process and outcome

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Differences between case studies

- The target fish species

- The purpose of the participatory modelling
  - Pragmatic – Problem framing and solving: jointly achieving an acceptable result (LTMP)
  - Theoretical – Improving the knowledge base
- The starting point
  - Established stakeholder groups, plan in preparation, partly consensus
  - Starting from scratch
- The process
  - Deliberation, mutual reflection, argumentative exchange
  - Analysis, focus on scientific approach

Lessons learnt

Less promising:

- Questionnaires, interview surveys to collect feedback
- Teaching/ informing stakeholders as THE objective

Promising :

- Face to face interviews, meetings
- Teaching/ informing built into the process as a means to achieve a better outcome
- Feeling of continuation, long term engagement
- Some starting consensus between parties

- Make sure to include ALL relevant parties and topics, be aware of official institutional processes
- Participatory modelling takes **time** – and it is worth it
  JAKFISH budget ensured long-term 'availability', but ends soon. What next?

Conclusions

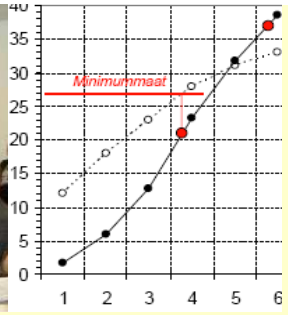
- Participatory modelling is one approach to increase transparency, mutual learning, understanding of uncertainties and risks, building of mutual trust, goodwill, support and ownership

➔ can improve quality of knowledge base and management decisions in the face of uncertainty ➔ increases legitimacy

- Participatory modelling in JAKFISH has set a step forward on the learning curve, next to other approaches.

Where people communicate with each other, it improves people's ability to understand each other!



Thank you!

Questions? Comments?

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Differences between case studies

- **WBSS Herring** and Mediterranean Swordfish fisheries **Multi-annual management plan in preparation**
  - Established stakeholder group, pragmatic approach, focused

North Sea Nephrops fishery
Management plan preparation - starting from scratch

- Identifying stakeholders, problem framing; unfocused; lack of mutual understanding

- Central Baltic Herring fishery
  Incorporating stakeholder knowledge into modelling
  - Mainly scientific approach: pooling stakeholder info, weighing different views, scoping for systemic uncertainties and risk probabilities

Multi-annual management plan in preparation

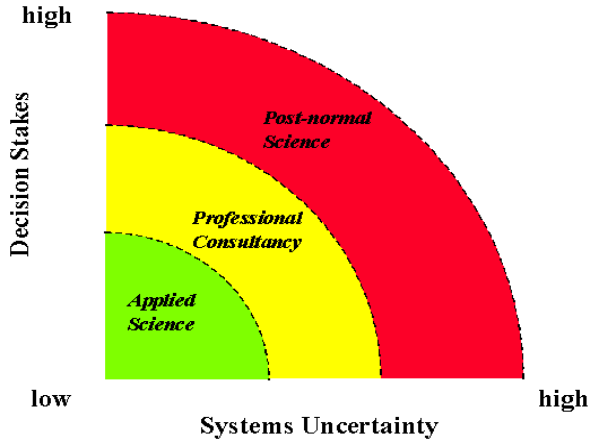
(a) WBSS Herring and Mediterranean Swordfish fisheries

- already established stakeholder groups;
- started with partial consensus (between stakeholders themselves and between stakeholders and scientists)
- identification of key sources of scientific uncertainty through pedigree matrices → pragmatic approach

Pedigree Matrices (Funtowicz and Ravetz 1990)

Goal : addressing non-quantifiable uncertainty

	Stock - recruitment	*Growth*	*Natural mortality (M)*	*State of stock (input in LTMP simulations)*	*Impact of climate change*
4	Clear visual and functional relationship	Well sampled and causes of fluctuations are well understood	Reliable estimates of M	***High quality assessment with uncertainty estimates***	Well understood consequences of experienced temperature fluctuations
3	Possible relationship	***Well sampled, but causes of fluctuations poorly understood***	Reliable estimates of M, but not at early life stages	High quality assessment, but limited focus on uncertainty estimates	Known impact on growth or recruitment or distribution
2	***No clear relationship, recent average used***	Poor sampling, and environmental effects on growth poorly understood	Poor estimates of M.	Rather low quality assessment	***Limited knowledge, and not accounted for in modelling***
1	Unknown	Unknown	***Unknown predation by cod and other top predators of the ecosystem***	Inadequate data and knowledge in assessment	No knowledge of temperature effects on stock



Management plan preparation - starting from scratch

b) Nephrops (Norway lobster) fishery

- No initial consensus on the problem and how JAKFISH could help.
- Stakeholders organised port meetings, “to set out clear objectives and a range of management options” → aiming at a plan that has industry “buy in”
- Scientists focused on technical modelling challenges; mapping out uncertainties
- Lack of mutual understanding; different perceptions about progress
- approach was preparatory; next step could be as under (a: WBSSH)

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Incorporating stakeholder knowledge into modelling

c) Central Baltic Herring fishery

- Scientific approach (Mental modelling, influence diagram, Bayesian model averaging): pooling stakeholder info, weighing different views.
- Scoping for systemic uncertainties, and uncertainties related to probability sides of risk
  → graphical “risk register”: to show actions, uncertainties and valuation of consequences