

Invest in fish

Can participatory modelling support social learning in marine fisheries?

Reflections from the Invest in Fish South West project (UK)

People in Places:
Engaging Together in Integrated Resource Management
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Seeking agreement through deliberation and knowledge sharing with the support of analytic models as decision support tools has increasingly been advocated for in science-intense policy making. There are few examples of participation in natural resource decision making where the interface of scientific modelling and stakeholder deliberation is described or analysed in detail. The Invest in Fish South West project used bio-economic modelling to support stakeholder deliberations and consensus building on policy recommendations for European marine fisheries. Based on interviews and experience as participants, we examine the model's contribution to social learning and highlight the importance of clear expectations within participatory assessments: the importance of process features surrounding modelling as well as the broader socio-political context influencing social learning. This examination illustrates a tension between a drive for evidence-based policy making and a post-normal science emphasis on knowledge co-generation.

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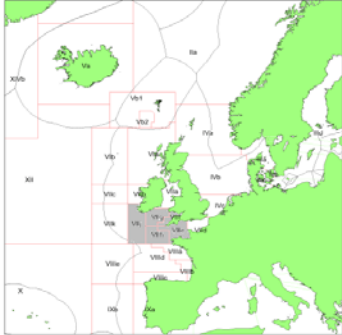
Participatory Modelling and Social learning in Invest in Fish South West:

Reflections on Design and Process

Overview

- Introduction and context
- Participatory modelling and social learning
- Participatory modelling and IIFSW
- Reflections and conclusions

Invest in fish Southwest



Project spatial remit:

- ICES VII (e-j)
 - South West Approaches
 - Celtic Sea
 - Western Channel
- (+) Modelling of viid, viik

Project Value & timeline:

- Approx. £1.7mil (C\$3mil)
- 3.5 years (2004-2007)

Funders:

- EU/UK Govt. (FIGG)
- Private foundations
- Partners

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Context: WHY - Problem or Motivation


- Declining fish stocks, declining revenues
- UK/EU governance tradition of 'command and control' (Symes 2007; Astorkiza *et al.* 2006)
- EU fisheries – science dependent arena
- Perceived (solo) inability to influence policy decisions
- EC Common Fisheries Policy reform (2002)
- **Trigger** - Power to inspire: 'Choose or Lose' report (WWF-UK)

Reflections:

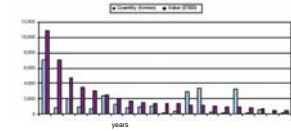
- 'Wicked Problem' (Jentoft & Chuenpagdee 2008; Rittel and Webber 1973)
- - Agreement on the nature of the problem?
- - Motivations for choice of modelling?

Landings series, 1973 to 2005, for Area VII d-h (tonnes)

Total landings by group



Volume and value of species landed in main south-west ports, to 2005



Project Partners

WHO



- Commercial fisheries
- eNGOs
- Govt conservation
- Govt regional development
- Fish processors
- Restaurateurs
- Recreational users (sea anglers)
- Retailers (large supermarkets and fishmongers)





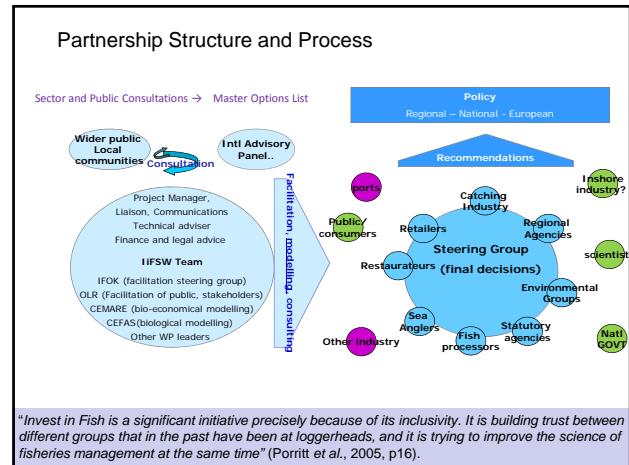
Project Purpose

"Develop fisheries management recommendations which ensure a prosperous and sustainable future for the region's fishing industry, communities, and the wider marine environment"

- Multi-stakeholder** engagement and decision making
- Science:** Production and use of **bio-economic model (and other evidence)** to test options generated by stakeholders,
- Analytic deliberation** to support social learning and consensus building
 - Participatory modeling as Decision support tool
 - Analytic deliberation > social learning
- Joint report** of consensus based policy recommendations with cost-benefit analysis of priority options.

Notes:

- Management and research focused
- Stakeholder driven and managed
- Advisory, not formal governance



Management Work Packages

- WP1 Project Manager and Technical Consultant
- WP2 Legal and Financial Management

Stakeholder Engagement Work Packages

- WP3 Steering Group
- WP4 Communication and dissemination
- WP5 Liaison officer
- WP6 Public consultation
- WP7 Facilitation (Steering Group)

Allocation of Project Resources approx. 20% of spend

Evaluation and Modelling related Work Packages

- WP8 Advisory panel (with Technical support Group)
- WP9 Wildlife impacts
- WP10 Sea angling (Nautlius)
- WP11 'No-Take Zone' (protected areas) workshops
- WP12 Legal, institutional, monitoring and implementation
- WP13 Evaluation/methodology workshop
- WP14 UK Regional economic module
- WP15 UK Socio-economic data
- WP16 French socioeconomic data [n/a]
- WP17 Irish socioeconomic data [n/a]
- WP18 Spanish socioeconomic data
- WP19 English Channel biology model update
- WP20 English Channel bio-economic model development
- WP21 Western Approaches/Celtic Sea biology model creation
- WP22 Western Approaches/Celtic Sea bio-economic model creation
- WP23 Integration of bio-economic and regional econ models
- WP24 Initial cost-benefit evaluation of options
- WP25 Final cost-benefit evaluation of options

Difficult to model or Not modelable

Data sets unavailable

Key Terms and Literature

Analytic Deliberation:

Integrative approach to participatory policy making including experts, stakeholders and public (Stern & Fineberg, 1996; Tuler & Weblor, 1999; Weblor et al., 2001; Sweeney, 2004).

- Systematic and reproducible knowledge**
- Deliberation** – evaluation of evidence and claims:
 - Mutual exchange of arguments and reflections, not based on status of the participants, sublime strategies of persuasion or socio-political pressure. Deliberative processes should include debate about the relative weight of each argument and a transparent procedure for balancing pros and cons (Tuler & Weblor, 1999).

Social Learning:

- Soft systems theory:** sustainable management of natural resources requires a soft system – or platform (MSP) – that supports social learning by sharing and validating stakeholder views, knowledge and understandings (Rolling & Jiggins, 1997)
- Deliberative theory:** better decisions result from inclusivity: “more legitimate, more reasonable, more informed, more effective and more politically viable” (Renn & Schweizer, 2009; Warren, 2007, p272).
- Community of Practice** (Wenger 1998): People learn through engaging in joint processes
- Habermas' *communicative rationality*; Dewey and Piaget's *constructivist learning*,
 - Social learning as knowledge exchange** - knowledge as contested, socially constructed and context relevant (McCrum et al., 2009). Importance of problem framing and world views.

Key Terms and Literature

Participatory Modelling:

- 'Mediated modelling approaches' (van den Belt, 2004; Weblor et al. (2011):
 - "bridges between rival epistemologies as proxy storytellers" (Wright et al., 2009, p255)
- Evaluative potential of participatory modelling, supporting stakeholders to unpack the underlying assumptions of modelling as well as their discrete underlying belief and knowledge systems (Dreyer & Renn, 2009).
- Suggested as means to:
 - incorporate a wide range of viewpoints and data sets (Lynham et al., 2007);
 - assist collective decision making processes;
 - explicate tacit knowledge, preferences and values;
 - improve legitimacy of a model;
 - promote creativity and innovation;
 - investigate individual behaviours and collective dynamics;
 - enhance individual and **social learning**; and
 - inform and enhance collective action (Danniell & Ferrand, 2006; Renn, 2010)
- Assessment of participation in modelling: (Johnson 2009): model applicability, accessibility, accuracy

	Criteria and indicators for stakeholder participation in modelling	Process factors for social learning
	Criteria	Indicator
Technical features	Model Accessibility : process and outputs	Model is user-friendly, well documented with easily understandable outputs
	Model Accuracy :	Appropriate trade-offs between uncertainties are jointly decided
	Model (spatial) scale	Fit between scale at which participants and modellers operate
Process features	Modelling time frames	Alignment between when participants would like to have information and when modellers can provide
	Appropriate representative involvement	Modelling involves participation from the full range of those directly and indirectly impacted
	Continuous involvement	Process involves participants throughout, with modellers providing feedback on participants' substantive impact at each stage
Contextual features	Model decisions	Participants' values and knowledge have bearing on decisions made in the modelling process.
	Model Applicability	Scope of problem and fit of the model, decided jointly
	Impact on participatory process	As a focus of interaction the model triggers social learning
	Clear link between model and project objectives	Modelling process and outputs support project objectives

Informed by Korfmacher (2001); Johnson (2009); Schusler et al. (2003)



Invest in fish Model

A model of the interactions between

- Fish stocks
- Fishing fleets (via fishing effort)
 - Includes revenues and costs/profits
- Environment (impacts)
- Regional economic outputs and employment

DESIGNED TO COMPARE OUTCOMES OF DIFFERENT MANAGEMENT MEASURES – TESTING SCENARIOS OR OPTIONS, IN ISOLATION OR AS PACKAGES

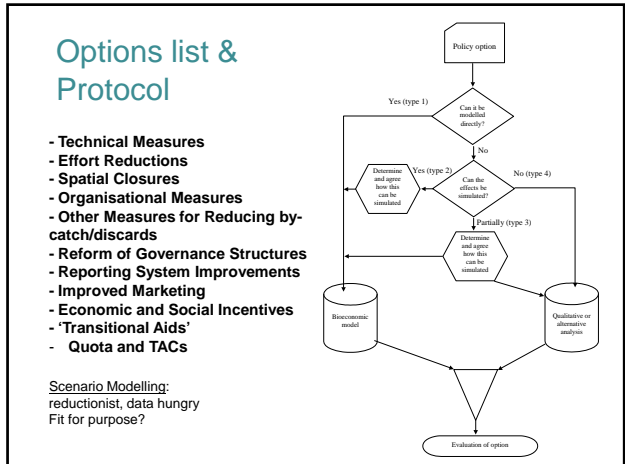
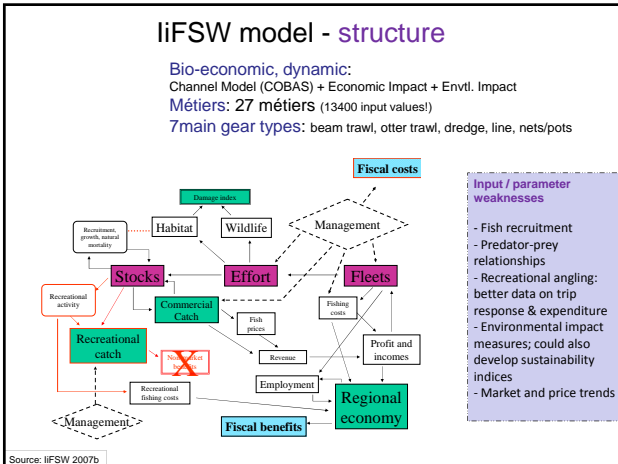
All options reviewed for impacts on:

Environment

Commercial fishing

Angling

Regional economy



Modelling/process Support Tools

- **Stakeholder workshops**
 - single sector and multi-sector: validation meetings
- **Sector specific communications**
 - existing networks (eg. FPO mailouts, angling posters)
 - Full time communications and liaison posts
- **Steering Group:**
 - sub-committees: non-modellables/other issues
 - additional events (beam trawl trip with MEPs, Royal visits – launch of new products, ties to regional events)
 - Sector sessions with modellers (SG member as 'lead')
- **Public Understanding and Involvement:**
 - Public champions programme
 - Session with fishermen explaining gear
- **Modelling:** Technical support group
- **Value tree joint construction and weighting**

Stakeholder involvement in knowledge generation and model development

Stakeholder group	Options generation	Model parameter scoping	Model data contributions	Model validation	Model communications	Non-modelling research	Options analysis
Commercial fishers	Yes	Yes	Y - Multiple, including new data on landings and fishing profitability	Yes - Focus groups	- bulletins - liaison officer - preparations - meetings	IIFSW study (A) attitudes of fishers	Independent Workshop + SG deliberations
Fish processors	Yes	No	No	Yes - Focus group	- individual & small group meetings - liaison officer	No	Independent Workshop + SG deliberations
Fish retailers	Yes	No	No	Yes - Focus group	- meetings with large retailers & fishermen - event hosting	No	Meeting with fishermen and retailers
Restaurateurs	Yes	No	No	No	- event hosting - guests at SG meetings	No	Meetings + SG representative for deliberation
Recreational fish anglers	Yes	No	Y - Commissioned study (C) Angling contribution to regional economy - Incorporated	Yes - Focus group	- liaison officer - sociates - bulletin	Commissioned study (C) Angling contribution to regional economy	Workshop + SG representative at deliberation
Environmental interests	Yes	Yes	Y - Commissioned study (C) Environmental Damage Index - Incorporated	Yes - Focus group	- liaison officer - meetings	Commissioned study (B) Octaceans by-catch	Workshop + SG representative at deliberations
General public (consumers/citizens)	Yes	No	No	No	- forum - workshops - ambassadors	No	Workshops only
Regional planning/statutory bodies (govt)	Yes	No	No	No	- newsletter	No	SG representative at deliberations



Social Learning?

- **Steering group reached consensus**
 - Final package of recommendations
 - Closer to a common problem definition:
 - Jointly agreed vision statement for region
 - Instances of co-production of knowledge

Social Learning?

Social learning issues

- **Representation**

"Representation - I did not find it particularly different from my experience elsewhere, in that people who attend as representatives take their positions very seriously. However, some of the 'representation' is what I would call 'tenuous'. How can one person claim to represent 100 000 recreational fishers, for example – know all of their needs and give them regular feedback on what decisions are made on their behalf?" (Interview, modeller)

"My overall feelings are that the core issue is getting the engagement and the genuine buy in to such a project from the commercial catching sector, but at the same time ensuring their participatory role does not swamp the roles of others." (Interview, SG member)

I believe that the level of stakeholder participation in the Invest in Fish project was possibly the best that I have come across. I am not quite sure how the participation and enthusiasm of such a large group was maintained over such a long period of time but however it was achieved someone is to be congratulated. (Interview, modeller)
- **Capacity**

"Invest in Fish was a good experience for me, I learnt a great deal, but was constantly frustrated with my own sector's level of engagement and therefore support. I felt I was out on a limb too often with no one sufficiently familiar with issues to bounce ideas around with. That is not a reflection of the project or participants, simply a criticism of the sector." (Interview, SG member)

Social Learning?

Social learning issues

- **Social networks**
- **Broader social & political context**

Decisions taken inside MSPs do not constrain individuals (or organisations) from taking different actions outside such platforms (Moreyra and Wegerich 2005) :

- Lyme Bay,
- EU Court on cod,
- etc.

liFSW participatory modelling & social learning?

Issues:

- **Capacity:** time, knowledge, other resources
 - Stakeholder fatigue
- **Trust:**

We generally found that the relationship between ourselves and the fishermen or other stakeholders was very good, and that there was eventually mutual understanding (and I hope trust) on both sides. I think there was some initial mistrust, partly because Cefas is a government agency and the fishermen know how shaky some of the available datasets are, however some scepticism seems to have been allayed once the models started to give some intuitive results
- **Scale**
- **Model type:** Reductionist (vs. exploratory, inclusive of knowledge types/world views – e.g. concept mapping)
 - Fit for purpose?

liFSW participatory modelling & social learning?

Issues (cont)

- **Uncertainty and complexity**

What does scenario modelling mean? What does uncertainty mean? Stakeholders expect models to fit reality and future realities. If a model can't predict with accuracy 50% of the time, you're better off flipping a coin. That is why we can't forecast. We can only compare alternatives and the relative differences between them as a strategic exercise in learning. (Interview, modelling scientist)
- **Expectations:**

"I remember being amazed at how the participatory approach resulted in many more meetings and workshops than the modelling teams had envisioned or budgeted for. The number of meetings that the modelling team was required to attend, and thus the level of interaction between the stakeholders and the modellers, was much greater than we thought it would be. Not that this was necessarily unwelcome, but it reflects the difficulties in managing expectations". (Interview, modelling scientist)
- **Critical features:**
 - Process supports, formal facilitation, science communication tools

Now what?

Longer term transformative potential?

"Yes, I think the longer term nature of relationships do matter. I can see a better sense of reality than we had before just amongst ourselves. But it depends on the group – for e.g. the [X] – they're a pressure group, so their position is what it is no matter how much we work with them. Now [Y], he's able to talk the same language as us, he can come to the table – I've seen him alter his views on certain issues". (Interview, SG member)

Wider governance implications:

"The RAC process is going pretty well and after some years now there is a gradual improvement in relations around the table. The Invest in Fish process continues to have an influence here - it really does - with so many from Invest in Fish being on the RAC from the UK" (Interview, fishing SG member)

[More research needed!]



Squires, H. and O. Renn. (pending) Can participatory modelling support social learning in marine fisheries? Reflections from the Invest in Fish South West project. *Environmental Policy and Governance*. Sp. Issue: Participatory Modelling.

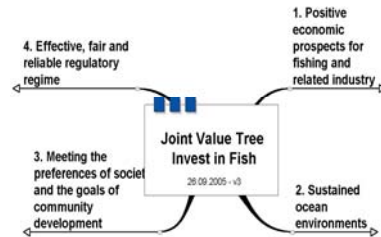
Thank you

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Enabling Science Uptake in Australian's Coastal Zone
 CSIRO Wealth from Oceans Flagship <http://www.csiro.au/partnerships/Coastal-Cluster.html>

SG Formal Decision making based on agreed shared values

Weighted Decision Making



Learning:

- Effective workshop exercises for opening debate
- Overall:**
- More facilitation time needed on project
- Lack of formal engagement plan for SG networks (additional resources)
- Clearer links (and communications) between work packages

Source: IFOK

Options - Testing scenarios

Types of options that can be readily modelled

- Days at sea
- De-commissioning/capacity reduction
- Gear changes
- Power changes

Options that cannot be modelled

- Protection of small areas to achieve particular conservation objectives
- Zoning of close inshore waters (e.g. <30m) to reduce conflicts between recreational and commercial fishing.

Types of options that can be easily modelled

- Mesh size changes (catchability)
- Spatial closures
- Based on assumptions that change key model coefficients.**

Types of options that require assumptions to be made about behaviour of fishing industry.

- Individual Transferable Quotas (compliance, enforcement)
- Model provides main results, needs qualitative element also.**

Different Fish Stocks Modelled

- bass afg, bass_d, bass_e inshore, bass_e offshore
- bream
- brill
- cod
- gurnard
- haddock
- hake
- herring
- lemon sole
- ling
- mackerel
- megrim
- monk_bud
- monk_pis
- plaice_d, plaice_e, plaice_fg
- pollack
- sole_d, sole_e, sole_fg, sole_hk
- turbot
- whiting
- horse mackerel

- crab
- cuttlefish
- lobster
- scallop

- other

} Age structured models

} Dynamic surplus production models

} Constant catch rates