FORWARD
Framework for Ria Formosa water quality, aquaculture, and resource development

Terceira reunião plenária
Workshop de resultados

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Parque Natural da Ria Formosa, Quinta de Marim, Olhão
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Objectivos

Avaliação de progresso e necessidades do projecto

Ponto de situação

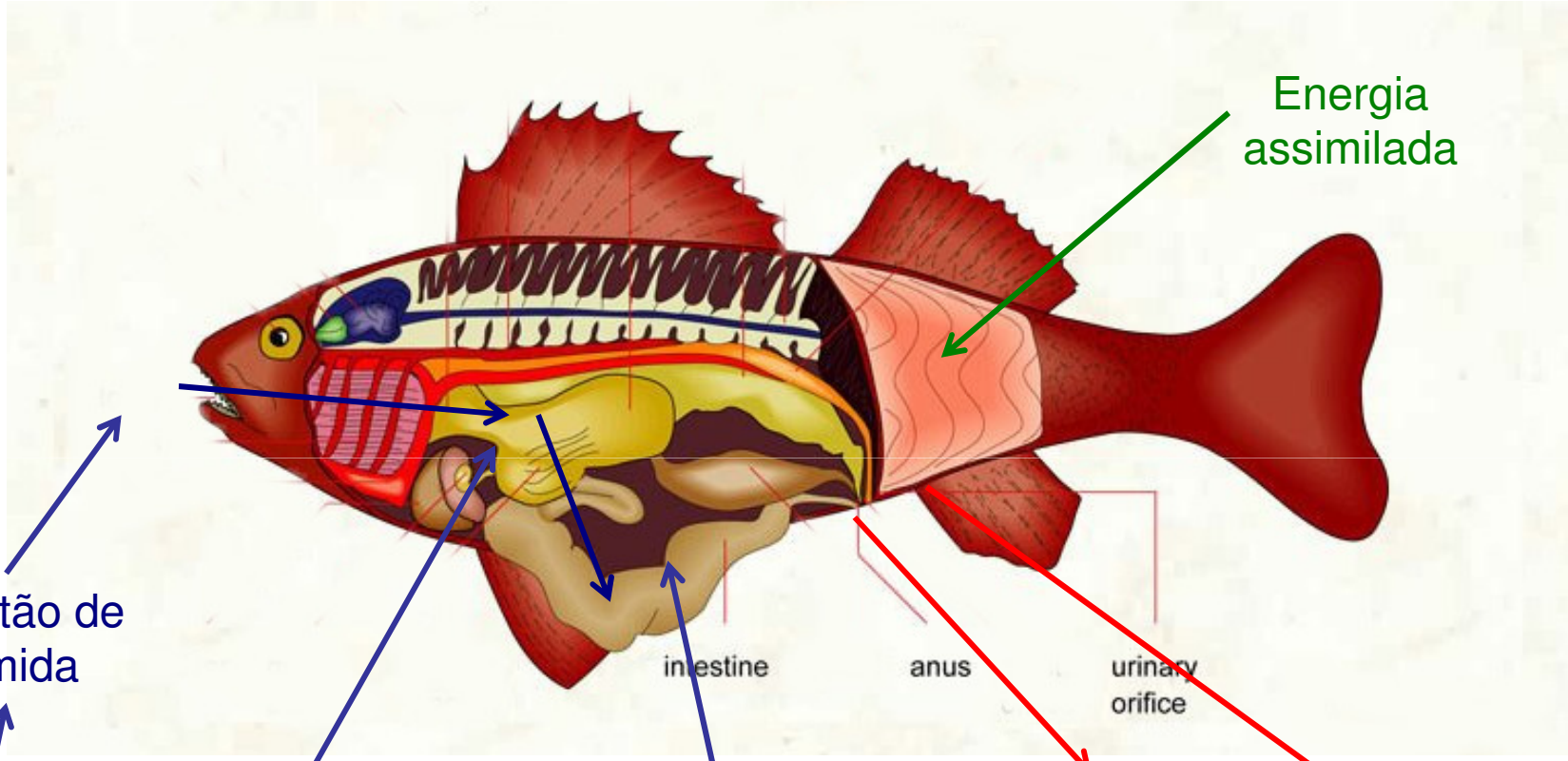
- Síntese dos vários participantes em relação às suas áreas de trabalho
- Explicar o que está feito, em curso, e para fazer. Quais as dependências e estrangulamentos
- Trabalho experimental e aquisição de dados de campo
- Trabalho de modelação
- Componente social
- Interacção com outros projectos
- Produtos do FORWARD, legacy, e dimensão social

A conjugação de actividades e resolução de problemas é vital nesta fase do projecto.

Agenda e Participantes

Características do modelo SCARF

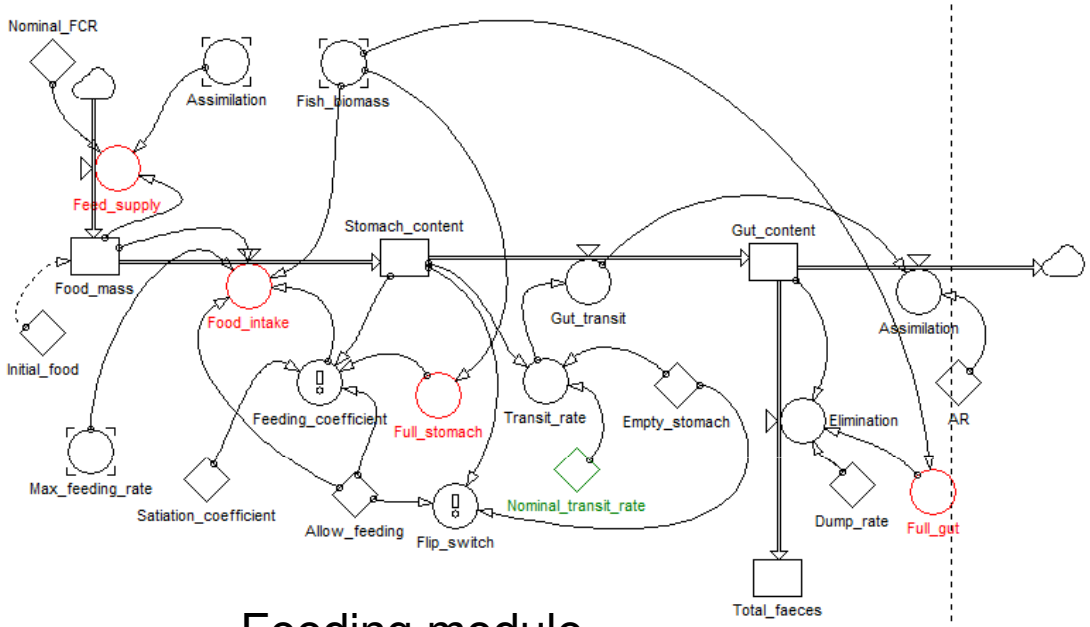
SCARF- Simulation of Cage AquaculturRe of Finfish

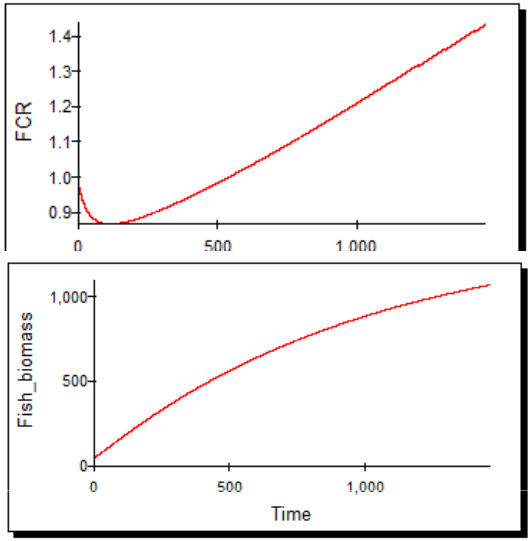


Modelo simula o crescimento do peixe e efeitos ambientais do cultivo.

Modelling of finfish growth in cages/ponds

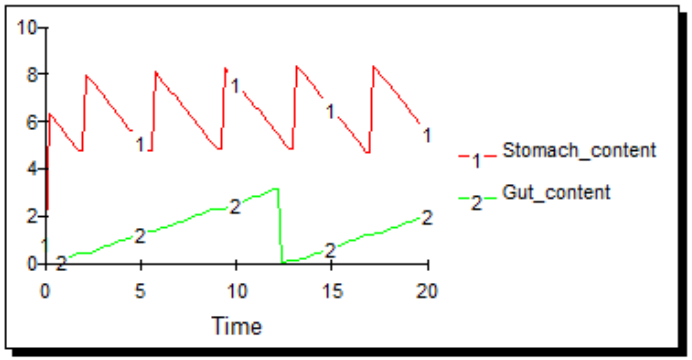
SCARF- Simulation of Cage AquaculturE of Finfish

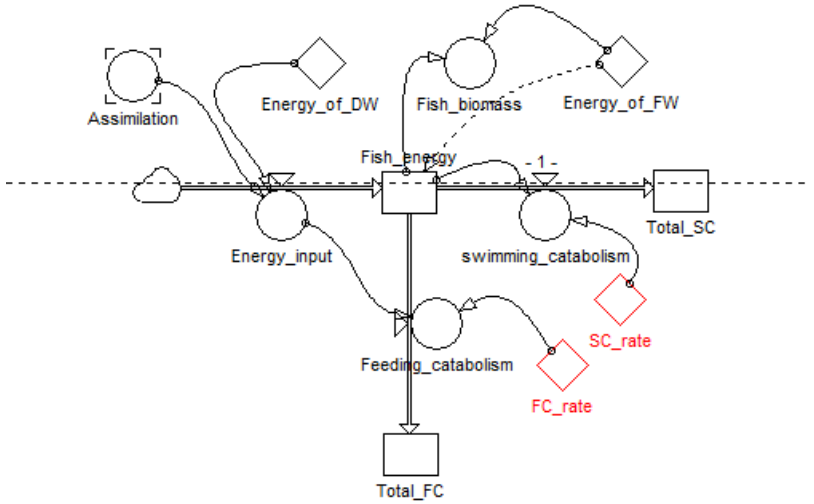




Net energy balance module

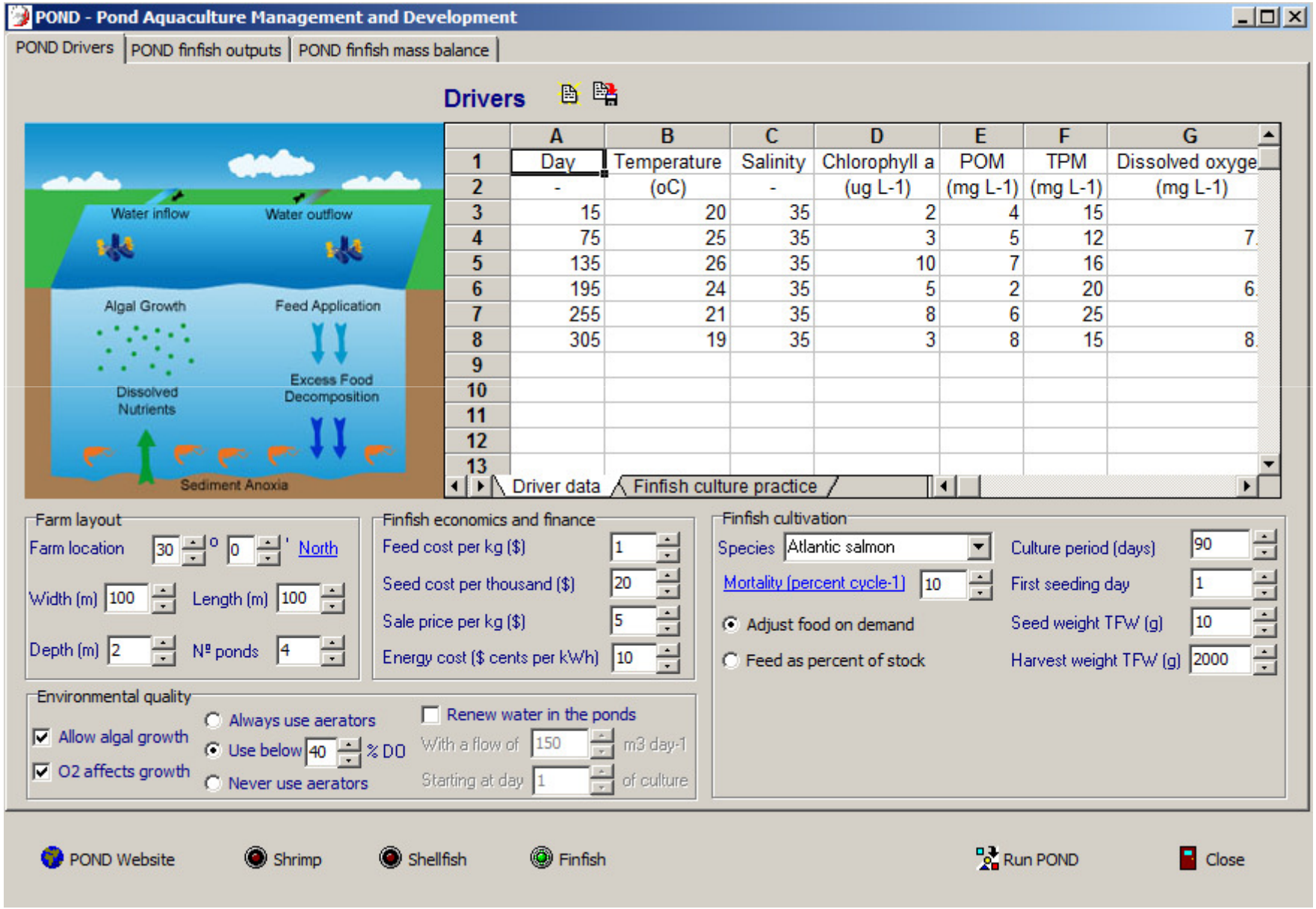
Feeding module



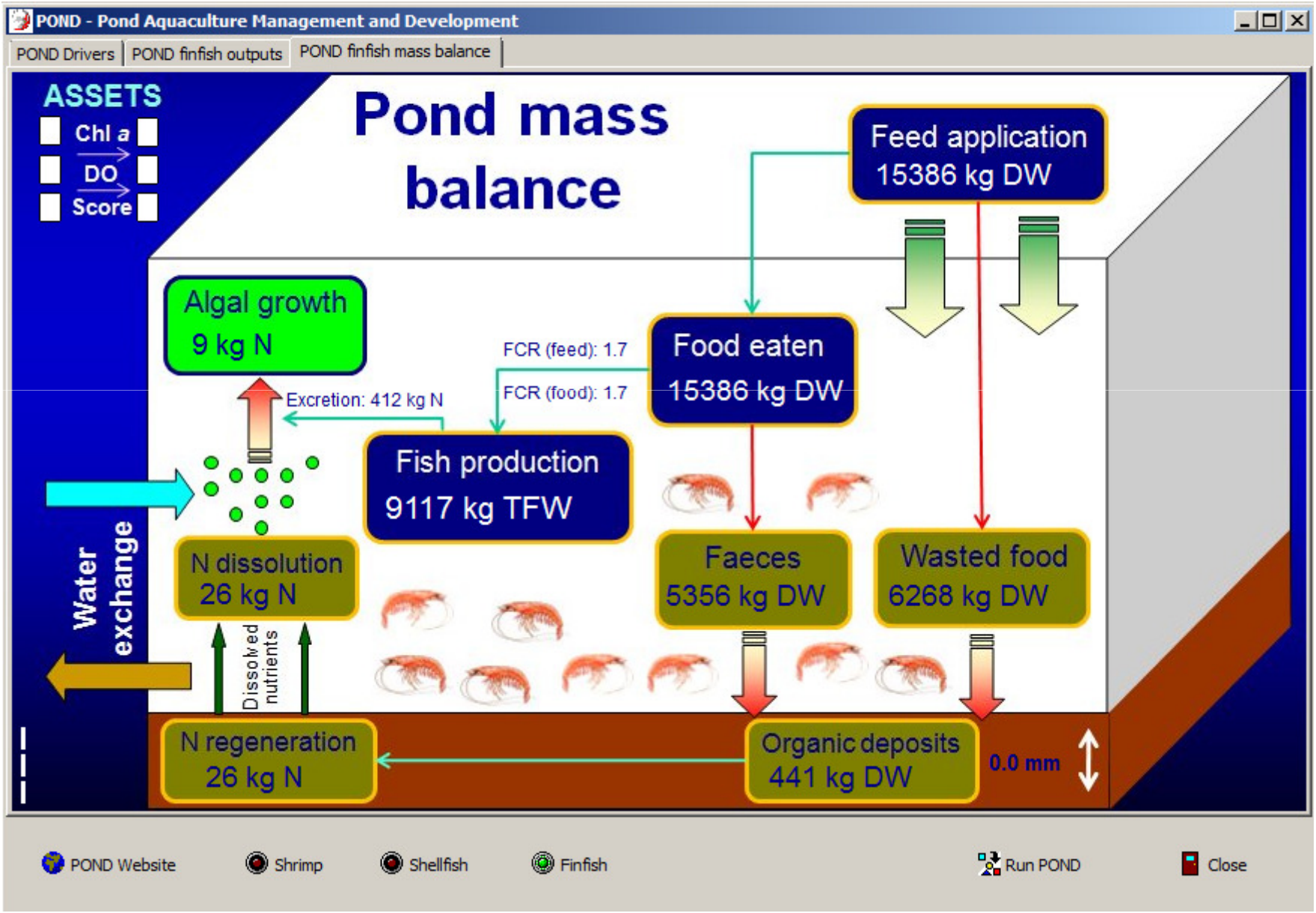


Modelação determinística da fisiologia de um peixe.

POND for land-based culture

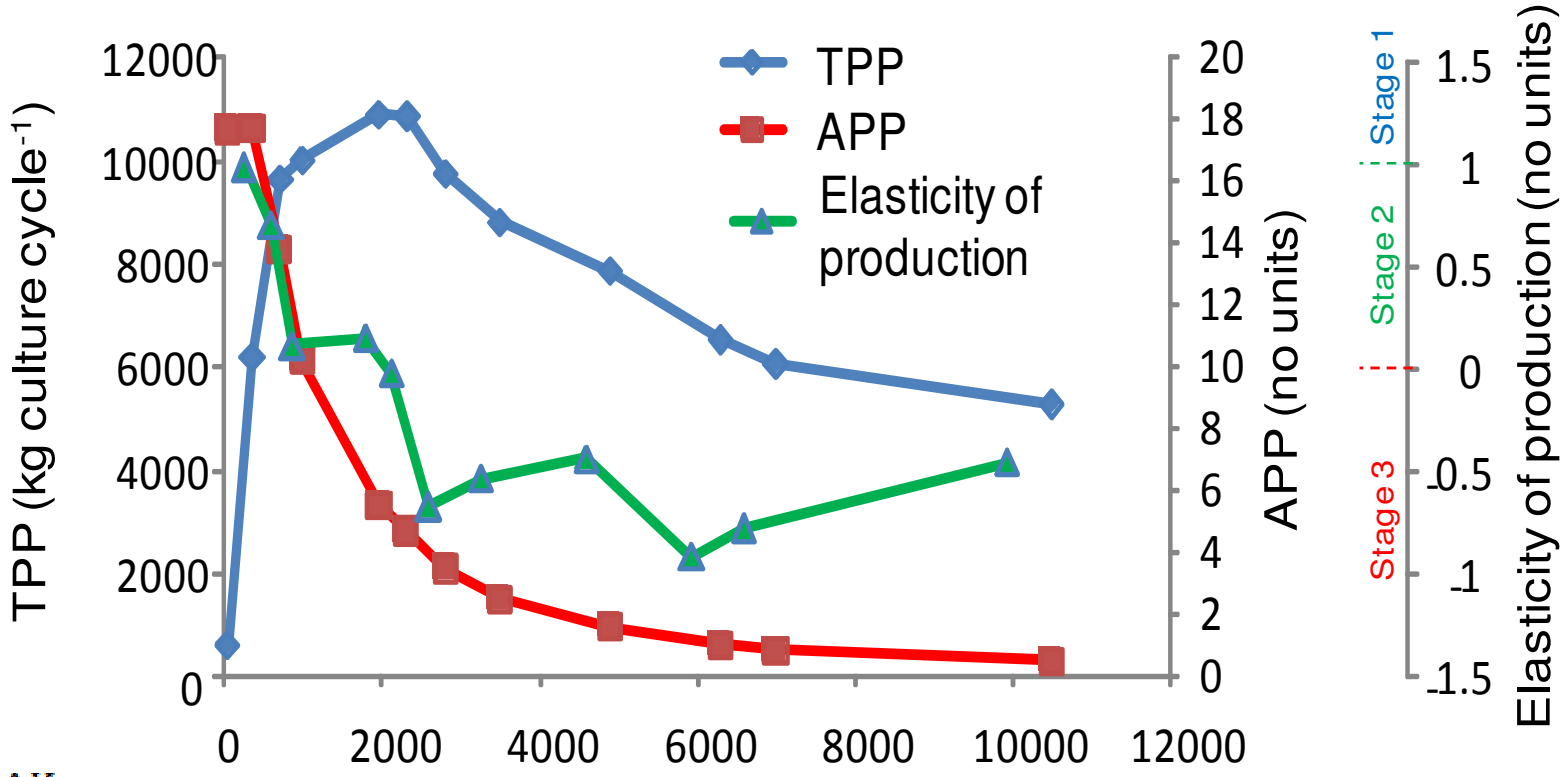


POND for land-based culture - finfish



Application of the POND model

Optimisation of shrimp production with dissolved oxygen limitation



$$E_p = \frac{\frac{\Delta Y}{Y}}{\frac{\Delta X}{X}} = \frac{\Delta Y}{\Delta X} * \frac{X}{Y} = \frac{MPP}{APP}$$

Production becomes more inelastic as stocking density increases. Relative changes in seed input have smaller effects on production until they lead to a decrease in output.

Certification / Codes of practice

Key points

- Producers' association: voluntary compliance by producers with a code of practice, adds value to the product, yearly update (e.g. 8h session)
- Move from producers' association to third party certification
- Farm plan – simple template, one per species (e.g. clam, oyster), 5-6 pages. Bill Dewey will forward an example

Hatchery / nursery

Key points

- Hatchery: important for local autonomy, biosecurity. Would allow selection for desirable traits
- Expensive (100K's €), market risk if natural seed beds have high recruitment
- Local discussion on private/public model. US – Washington State uses a private model
- Nursery: FLUPSY would allow purchase of smaller seed, development to a size suitable for planting. 24 bins, 10K's €. Local Ria interest more on oysters

Culture practice (mechanization etc)

Key points

- Use of mechanical devices, predator nets: plots are very small: 500 ha - 1300 licensees, 0.4 ha per plot. Lease sizes and authorization to use mechanical devices are both issues
- Constant digging because animals of different year classes are mixed together. No “year class rotation”, as is often used elsewhere

Thoughts – CoExist experts FIW

Food for thought...

- The use conflicts being addressed by FORWARD and CoExist are very similar to those restricting the growth of aquaculture in the U.S
- Biosecurity, production and area protection could be improved by implementing improved regulation combined with a high degree of stakeholder influence
- The shellfish production system is non-manageable as producers neglect to cooperate in fear of having to pay taxes, and exact information of production and profits are thus not obtained. As the formal regulations are sometimes too strict and inflexible to the existing production system, it is almost impossible to avoid breaking some of the rules
- Use of Value Chain Analysis (VCA) to analyse and develop the shellfish value chain with the objective of increasing effectiveness and competitiveness of the sector. This may involve looking at mechanisation, farmer cooperation, logistics, chain partners, markets, etc
- APPA de Armona: culture practice. An idea is the “all in all out” management strategy (mandatory in Norwegian salmonid aquaculture); high risk of “pathogen abundance build-up”, in area with high density cultured population, with potential consequences on the wild populations

Thoughts – foreign experts FIW

Food for thought...

Bill Dewey – External expert, Taylor Shellfish, U.S.A.

- The use conflicts being addressed by FORWARD and CoExist are very similar to those restricting the growth of aquaculture in the U.S
- Europe seems way ahead of the U.S. in attempting to address use conflicts relative to fisheries and aquaculture; in particular in the use of social science, modeling and marine spatial planning

Thoughts – foreign experts FIW

Food for thought...

Øivind Bergh – Coordinator of CoExist

- It appears to be a current mismatch between current aquaculture activities and legislation; This is a constraint for both of reducing growth potential of aquaculture production and of reducing the potential to increase
- Disease control requires high degree of transparency and “the rule of law”
- Biosecurity, production and area protection could be improved by implementing improved regulation combined with a high degree of stakeholder influence;
- Idea of local (low-tech and sustainable in economic terms) hatchery with higher degree of biosecurity: transparency diagnose and of relaying and seed sources
- Improve the husbandry practice by labour efficiency and area productivity;
- APPA de Armona: be careful with the culture practice. An idea is the “all in all out” management strategy (mandatory in Norwegian salmonid aquaculture);
- APPA: high risk of “pathogen abundance build-up”, in area with high density cultured population, with potential consequences on the wild populations;
- APPA: another idea is to some degree a joint management with other offshore sites, allowing for temporary non-use of given localities in a production cycle without fatal damages to markets;
- APPA: a transparent policy on information of diagnoses, prophylaxis and biomass and movement of animals made available to all stakeholders and users of the offshore site will be needed

Thoughts – foreign experts FIW

Food for thought...

Katrine Soma – Economic modeling CoExist project

- Comparing the production systems in Southern Portugal and the US, it is obvious that more profits can be obtained by changing existing production system in Portugal;
- Moreover, the nowadays mixed ages of shells, of which the biggest ones are selected from the smaller ones, can be replaced by cultivation of same age structures of shells in rows to further improve the efficiency of the production systems
- The shell production system is non-manageable as producers neglect to cooperate in fear of having to pay taxes, and exact information of production and profits are thus not obtained. As the formal regulations are sometimes too strict and non-flexible to the existing production system, it is almost impossible to avoid breaking some of the rules.
- The extent to which these people form a cultural value to the Portuguese society is for me unclear.
- More profits are expected to be welcomed in any sector if ecological and cultural values are not lost for future.
- Main conclusion is that changes would be welcomed if ensuring that experiences elsewhere regarding sicknesses and environmentally friendliness would be taken into account, and that changes would not occur without consulting with a larger publics' opinion. The present static regulations of the park could be changed to a more flexible one if arguments would be well defined.
- Spatial data on localization of vessels' harvests could be combined with information of fuel costs are necessary to be able to apply any spatial model to the site that includes moving vessels
- Also data on employment, discards, TAC-shares etc are also needed if existing model should be applied

Thoughts – foreign experts FIW

Food for thought...

Arie van Duijn – Economist CoExist

- When applying spatial management to manage the area it will be interesting to investigate how it can be applied to manage the activities (e.g. fisheries, aquaculture, salt farming, nature) in highly dynamic systems;
- Besides it would be interesting to compare the cost/benefit of stabilizing the system with the cost/benefit of applying spatial management to manage the activities in a dynamic system;
- Link the carrying capacity modelling and clams culture with economic model and then with spatial management of the human activities in the dynamic system and disease management and its spatial consequences;
- Certification and codes of practice of shellfish culture in relationship to market access. Branding and labelling of shellfish from Ria Formosa in order to create a higher market demand and try and increase the sales price;
- Use of Value Chain Analysis (VCA) to analyse and develop the shellfish value chain with the objective of increasing effectiveness and competitiveness of the sector. This may involve looking at mechanisation, farmer cooperation, logistics, chain partners, markets, etc;
- Market analysis. To look at different markets (local, national, EU, global) and competitors. This should not be limited to currently cultured species, but rather to species which are occurring locally and can potentially be cultured like for instance geoducks;

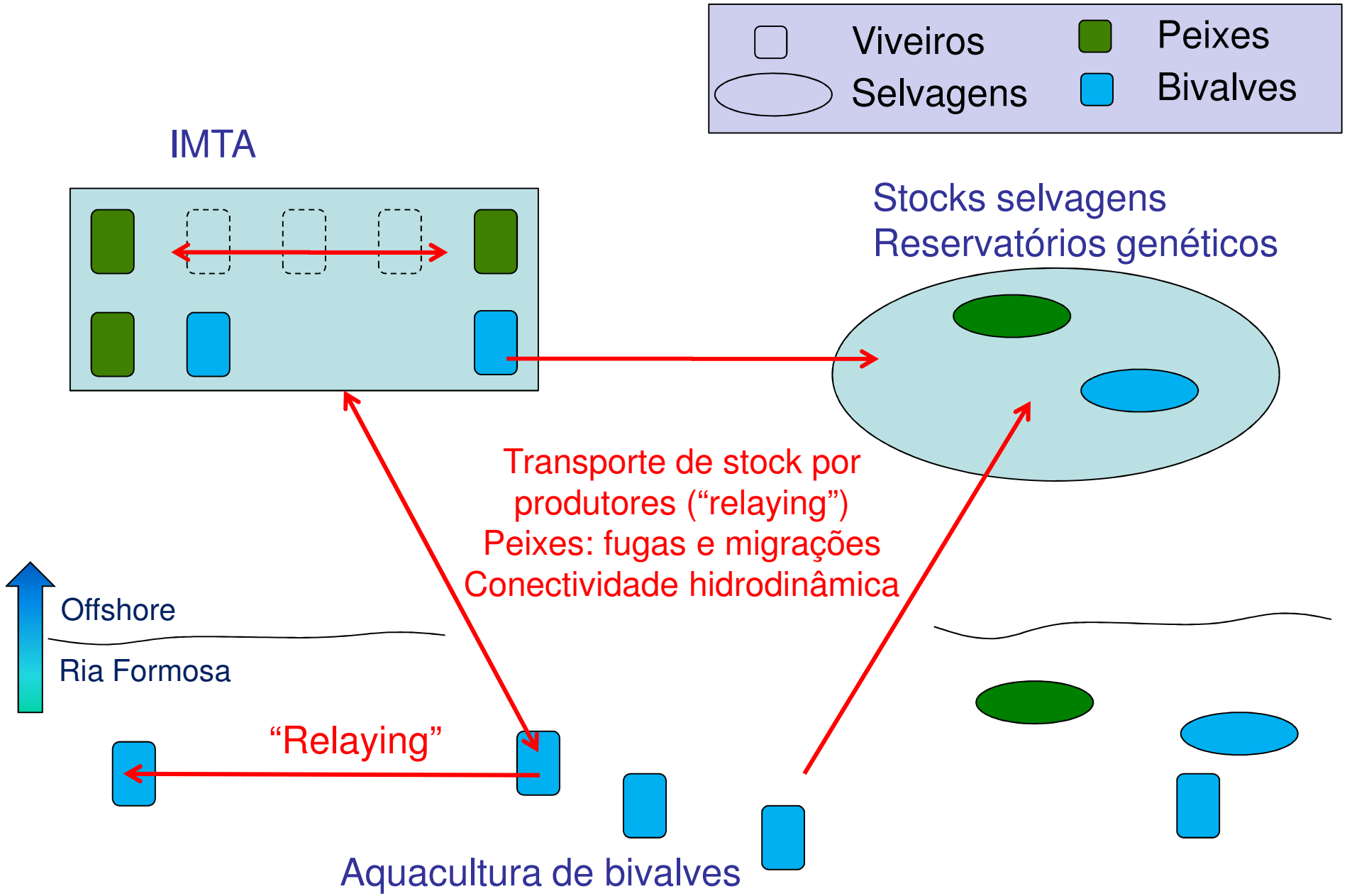
Thoughts – foreign experts FIW

Food for thought...

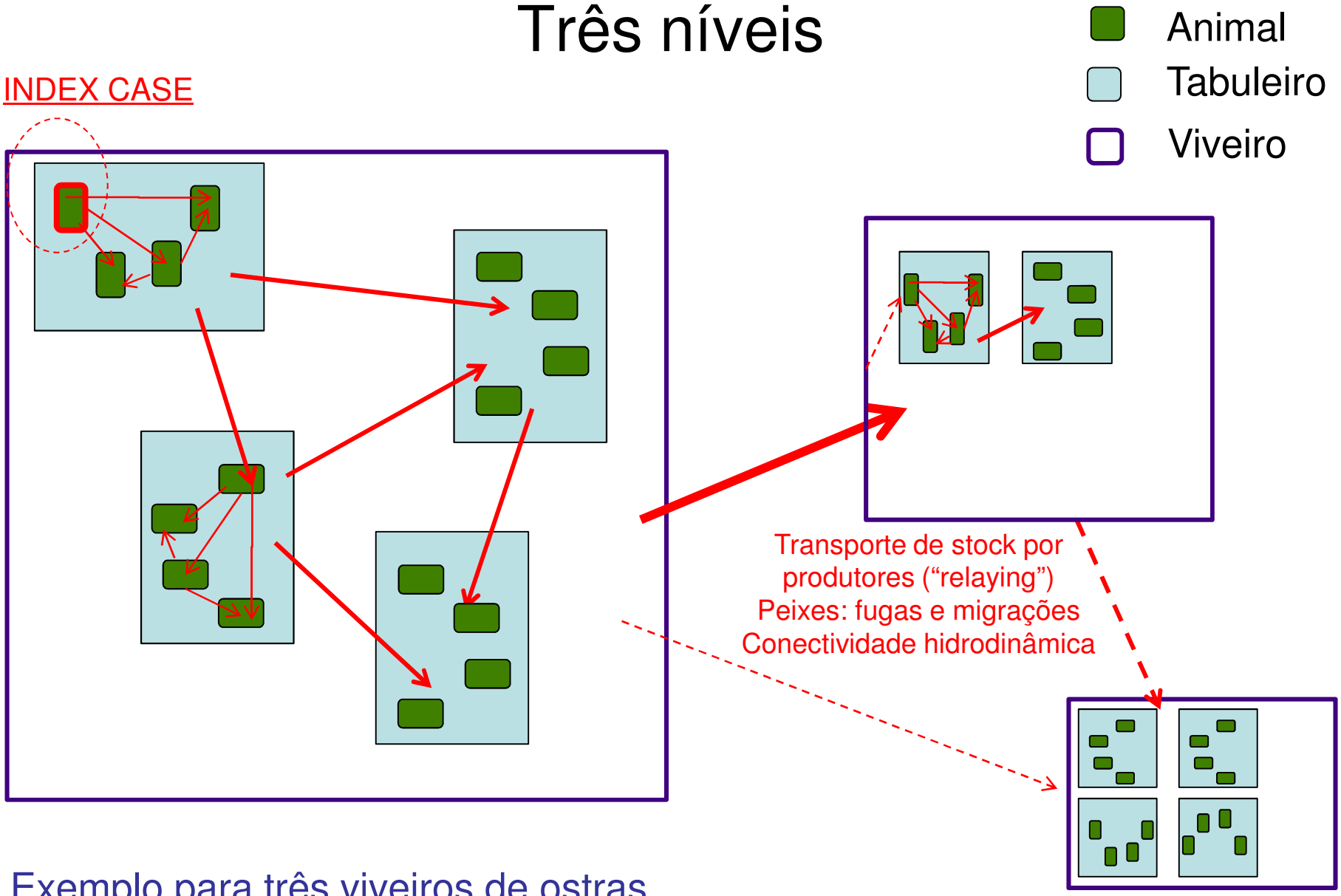
Nick Taylor & David Verner-Jeffreys – Disease experts CoExist

- Effective coastal zone management is required to allow the Ria Formosa to maintain its unique character, but also allow its sensible exploitation for tourism, aquaculture and fisheries related activities;
- Problem of regulation due to the natural parque that are not being adhered to, and cannot be enforced effectively;
- Greater emphasis needs to be placed on working with stakeholders/user to develop practices that fulfil their needs whilst minimising their impact to the reserve.
- Disease is obviously an integral part of the ecology of farmed and wild fish and shellfish, as with other animals. This needs to be recognised and integrated into aquaculture and fisheries planning and development activities;
- The ability to source and/or produce seed is critical and should be a priority;
- It should be emphasised that all aquaculture production businesses should have effective biosecurity plans in place that will minimise the chances of disease outbreaks taking place, and when they do take place, what steps should be taken to control them (at all levels; farm to National);

Modelação de saúde animal



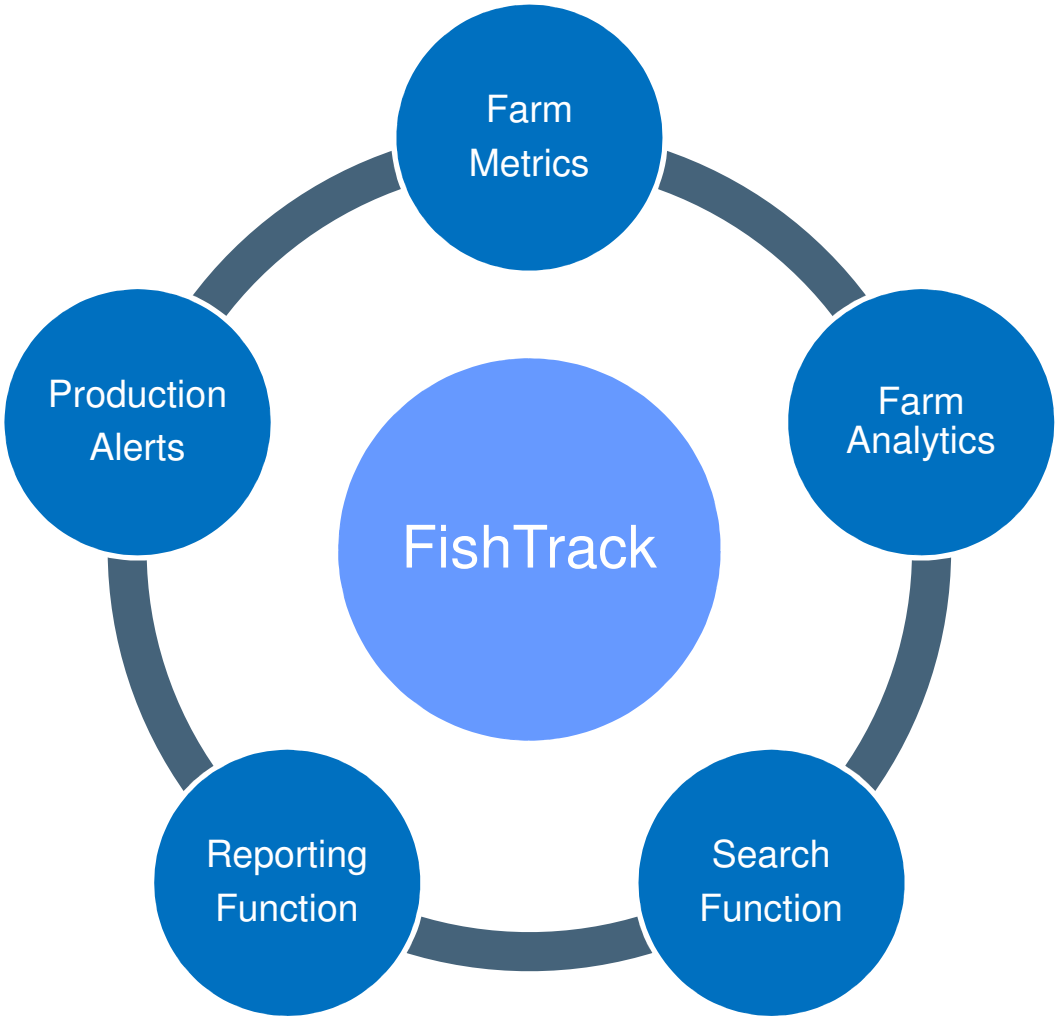
Saúde animal – modelos de rede
Três níveis



Exemplo para três viveiros de ostras

FishTrack

Functionality



- **Farm Metrics** – Breakdown of farms by location, species, mapping of farms.
- **Farm Analytics** – Overall production across ponds, cages, longlines, production numbers, seeding and harvesting information, etc.
- **Search Function** – Customised search function
- **Reporting Function** – Generation of custom reports with export functionality to spreadsheets such as Excel or Google Docs.
- **Production Alerts** - Ability to set different alerts, based on harvest dates and other key points in the production cycle.

O livro do FORWARD

Porquê um livro em ingês...

Quatro boas razões?

- Para **divulgar** o trabalho a nível **internacional**, temos três mecanismos: conferências internacionais (são divertidas só naquele momento, depois ninguem se lembra), artigos científicos (só cientistas lêem), e... um livro em inglês – com base nos livros da NEEA, TICOR, MONAE, SMILE, e SPEAR, a minha experiência é que têm um enorme impacto
- Eventuais **conflitos** que surjam com a **Comissão Europeia**, ou outras instâncias, em relação à Ria Formosa, vao beneficiar de um livro em inglês que detalha as medidas que se procuraram implementar, e que possa ser **distribuido em Bruxelas** quando conveniente
- Se tomarmos essa opção, temos que resolver o assunto agora. Se não **começarmos agora**, o livro não se consegue escrever a tempo. E se não for produzido até ao fim do projecto, não se consigue fazer depois
- Um livro em inglês, com sumário executivo e resumos de capítulos em português, **é o melhor dos dois mundos**: é inteligível em Portugal e projecta o FORWARD internacionalmente como o melhor que se faz no mundo. Simulataneamente **projecta o POLIS e a ARH-Algarve**, da mesma forma que o DARD da Irlanda do Norte foi projectado com o SMILE

Overview and target audience

- Multi-author book from the whole FORWARD team, describing the different components of the project, the approach and key results;
- Aimed at a broad technical audience, ranging from water managers to scientists to undergraduate students;
- Each chapter must be self-contained insofar as possible, to avoid someone having to go through the whole book to look at a specific topic of interest;
- Written in English, avoiding specific jargon (e.g. detailed species lists in Latin) or convoluted chapter numbering, with a maximum of 100 pages;
- Content is backed up by scientific papers which provide QC from an academic perspective;
- High publication quality, appealing design and photography. Each page must interest a casual reader by means of a combination of text and graphical elements. This may be the closest we come to writing something people will read without being paid to do so.

O livro do FORWARD

Proposta de estrutura

Capítulos

Nº	Título	Temas	Autores	Pág.
1	Introdução, objectivos	Inclui descrição geral da Ria Formosa, dados existentes, estado da arte re: aquacultura, objectivos do FORWARD		
2	Aquacultura na Ria Formosa	Produção, problemas, perspectivas (aspectos ecológicos, económicos, e sociais)		
3	Ferramentas desenvolvidas e aplicadas	Modelos – bacia, hidrodinâmica, ecológicos, sistema, farm-scale, ponds. Overview.		
4	Capacidade de suporte	Produção, ecológica		
5	Aspectos sociais e institucionais	Os outros 50% da questão, governância, etc		
6	Pilares de desenvolvimento futuro			
7	Lições importantes	1. André Pacheco, Óscar Ferreira, Ventura Soares; morfodinâmica da Ria, monitorização da batimetria 2. Taylor, Bergh, Verner-Jeffries: disease, lessons from Scotland, Norway, Chile 3. Dewey: Taylor Shellfish: growing a business for the community		

GEM – Geochemical and Ecological Modelling

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Timeline

Chapter outlines I – Introduction and objectives

- Overview of ICZM and review of management and policy issues;
- Description of the use of indicators, and the role of sustainable aquaculture as an indicator;
- State of the art of integrated management approaches;
- Overview of application of ICZM in SE Asia;
- INCO-DEV programme description and objectives;
- SPEAR outline and aims;