TAPAS
Tools for Assessment and Planning of Aquaculture Sustainability

Models and tools for planning and management of aquaculture

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asc Aquaculture Stewardship Council
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Why do we need models and tools?

- Aquaculture planning and management is complicated.
- Planning
  - Not every site is suitable, not every site is available
  - Conflicts over space and resources with other activities and users
- Management
  - How can a farmer optimise use of space and resources and minimise environmental impact.
  - Trade-offs between different scenarios

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Why do we need models and tools?

- **Producers**
  - Where are the best conditions?
  - Which site is most profitable?
  - Which site has least risk?
  - What equipment should I use?

- **Regulators**
  - Which site has the least impact?
  - How much fish should be farmed?
  - Would chemicals be used?
  - What about cumulative impacts?

- **Other resource users**
  - Can I still operate as normal?
  - Will this change the environment?
  - Can I benefit from this?
  - How can we stop this?

- **Wider community**
  - Would it affect my view?
  - Would it harm the environment?
  - Opportunities for employment?
  - How can we stop this?

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Why do we need models and tools?

- Decision-making is a complex process.
- Often involves value judgements.
- People can use tools to make an **informed** choice.

- Decision support!

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Model and tools used and developed in TAPAS

- Models and tools have been used and developed in TAPAS to simulate and assess many different aspects of aquaculture licensing, planning and regulation.
  - Including:
    - Use of chemical treatments
    - Dispersal of wastes
    - Environmental impact
    - Site selection
    - Ecosystem services

- Modelling approaches have been tested and validated at a number of representative case study locations.

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Model and tools used and developed in TAPAS

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Model and tools used and developed in TAPAS

- Includes new models but also existing models
    - Not re-inventing the wheel
    - Using and adapting existing models

- Key focus:
    - How can models be used by stakeholders?

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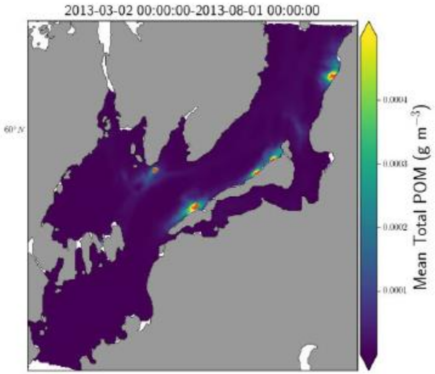
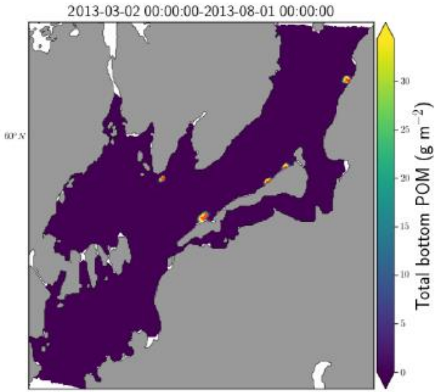
Model and tools used and developed in TAPAS

- Modelling waste dispersion from cages
  - Organic wastes
  - Treatments

- Can evaluate potential cumulative impact

- Can be used for planning and zoning, coordinating management





PML/NIVA

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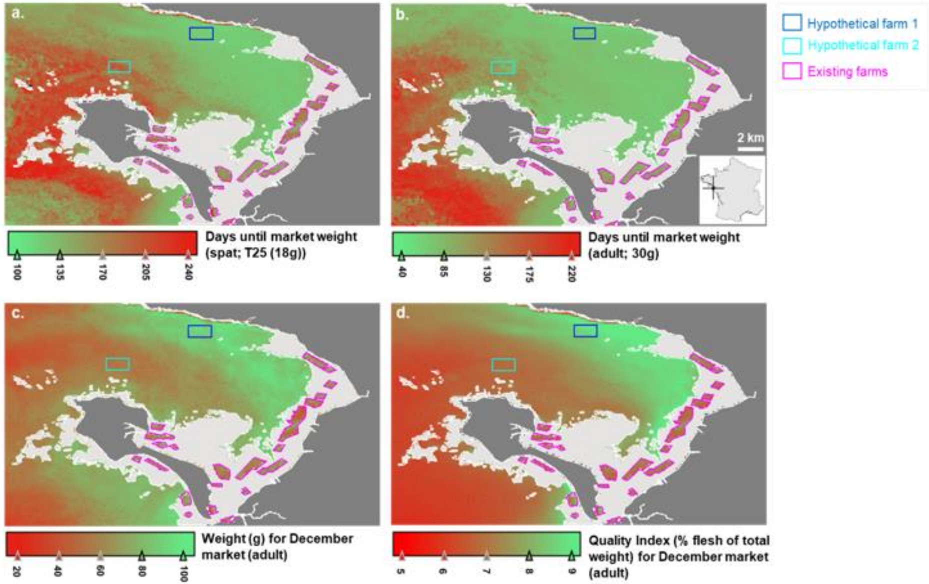
Model and tools used and developed in TAPAS

- Identifying suitable sites for shellfish production
  - Growth model coupled to Earth observation data
  - Investigate different production scenarios
  - Look at potential for moving from coastal to offshore sites.



University of Nantes/PML

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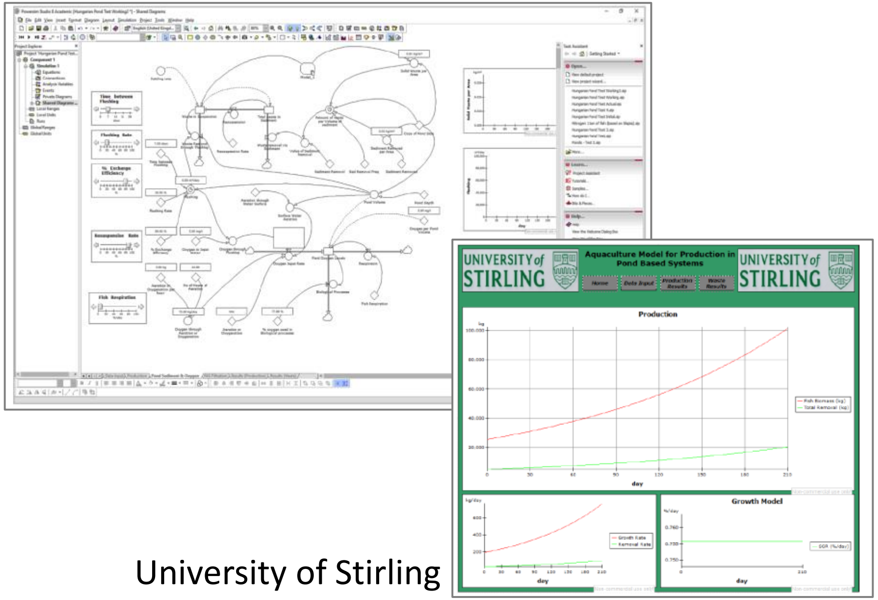
Model and tools used and developed in TAPAS

- Models for freshwater ponds systems
  - Carrying capacity assessment for large extensive and semi-extensive ponds
  - Assess different scenarios for multifunctional ponds
  - Ecosystem services



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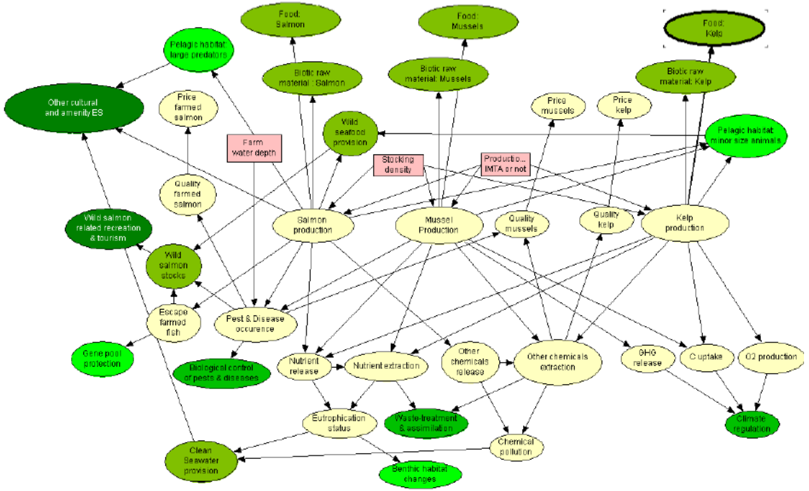
Model and tools used and developed in TAPAS

- Ecosystem services
  - Bayesian Belief Network for Integrated Multi-Trophic Aquaculture (IMTA)

  - Used to facilitate decision making between conflicting stakeholder interests



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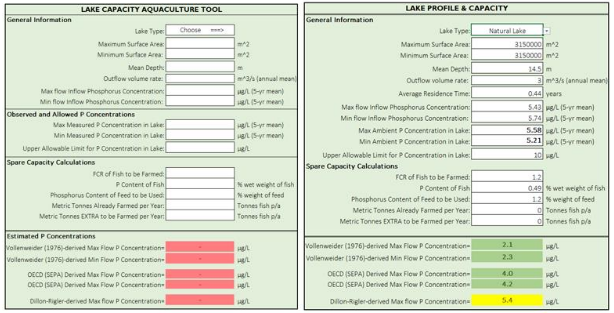
Range of different models

- Simple
  - Spreadsheet based
    - E.g. Assessment of phosphorus loading to freshwater lakes



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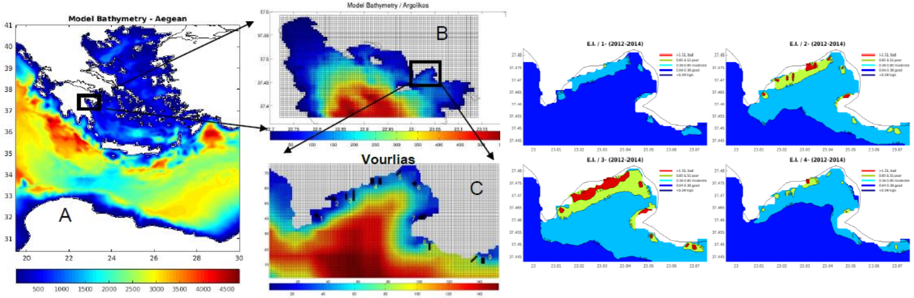
- Complex
  - 3D Hydrodynamic models coupled to biogeochemical models
    - E.g. Aquaculture Integrated Model (AIM)



HCMR

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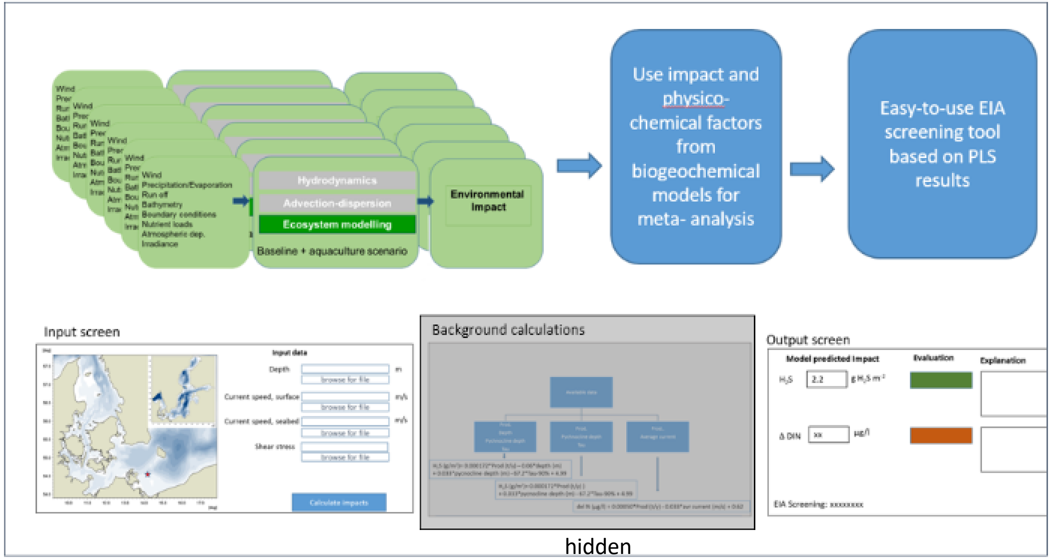
Turning models into tools

- More complex models simplified into tools
- User can run different scenarios but does not need to do the modelling



DHI

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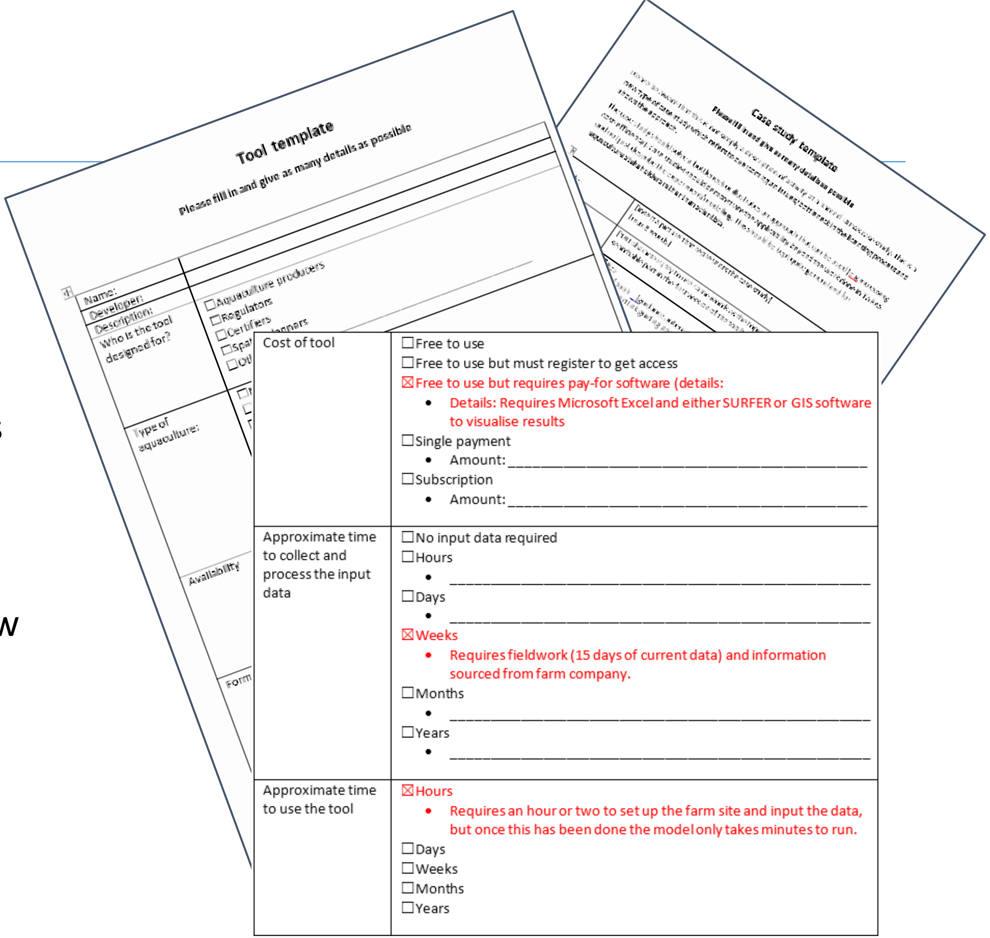
Information

- Common templates
- Will provide overview information so users can choose which tool is appropriate for their needs
- ‘Case studies’ will provide examples on how to use the tool for a specific purpose



Cost of tool	☐Free to use ☐Free to use but must register to get access ☒Free to use but requires pay-for software (details: • Details: Requires Microsoft Excel and either SURFER or GIS software to visualise results ☐Single payment • Amount: ___ ☐Subscription • Amount: ___
Approximate time to collect and process the input data	☐No input data required ☐Hours • ___ ☐Days • ___ ☒Weeks • Requires fieldwork (15 days of current data) and information sourced from farm company. ☐Months • ___ ☐Years • ___
Approximate time to use the tool	☒Hours • Requires an hour or two to set up the farm site and input the data, but once this has been done the model only takes minutes to run. ☐Days ☐Weeks ☐Months ☐Years

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Information

- What do users want to know about a tool?
  - How much expertise is needed to use it?
  - Is it ready to use immediately or would it need adapated?
  - Where can they get it?
  - Is there a cost?
  - What data, time and resources are required to use it?
  - Anything else?

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Summary

- There are many decisions involved in aquaculture planning management.
- Decision-making is a complex process which often involves value judgements.
- Models and tools can be used to help make an **informed** choice.

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The TAPAS Project

- **University of Stirling** (UK) (coordinator)
- **NIVA** (Norway)
- **DHI** (Denmark)
- **Water Insight BV** (Netherlands)
- **Alterra-Wageningen UR** (Netherlands)
- **Plymouth Marine Laboratory** (UK)
- **Universidad de Murcia** (Spain)
- **Université de Nantes** (France)
- **Hellenic Centre for Marine Research** (Greece)
- **Szent Istvan University** (Hungary)
- **AquaBioTech Group Ltd** (Malta)
- **Marine Institute** (Ireland)
- **NACEE – Eastern European** (Hungary)
- **Aquaculture Stewardship** Council (UK)
- **Fundacion Imdea Aqua** (Spain)

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