A Decision Support Software for the Greek Aquaculture

Implementation case study

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This project has received funding from the European Union´s Horizon 2020 research and innovation action under grant agreement no. 677039

Aim

to develop a DSS for the Greek Marine Aquaculture stakeholders

How

by simulating the effects of CC on aquaculture production and associated socio-economic indicators

Use

beyond the project time

Target species

- European sea bass (established)
- Meagre (emerging)

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Type of data available (1)

Climate data

- Sea Surface Temperature, wind velocity
- from CERES project, (POLCOMS – ERSEM)
  - **10 km x 10 km** resolution

Biological forecasting

Production Data

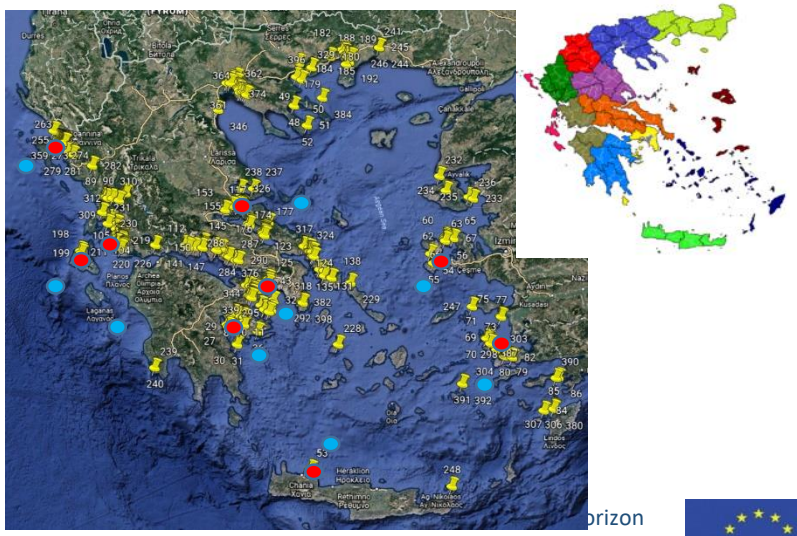
- Growth to Market size
- Duration of the on growing period
- Biomass produced
- Feed required (feeding rate and FCR)

Time scale

- Short term (2015-2025)
- Mid term (2025-2035)
- Long term (2045-2055)

The model Farm

- 3 stockings (March, June, September)
  - Capacity: 3x500K juveniles
  - 9 locations, (administrative regions)
- **Inshore** and **Offshore**



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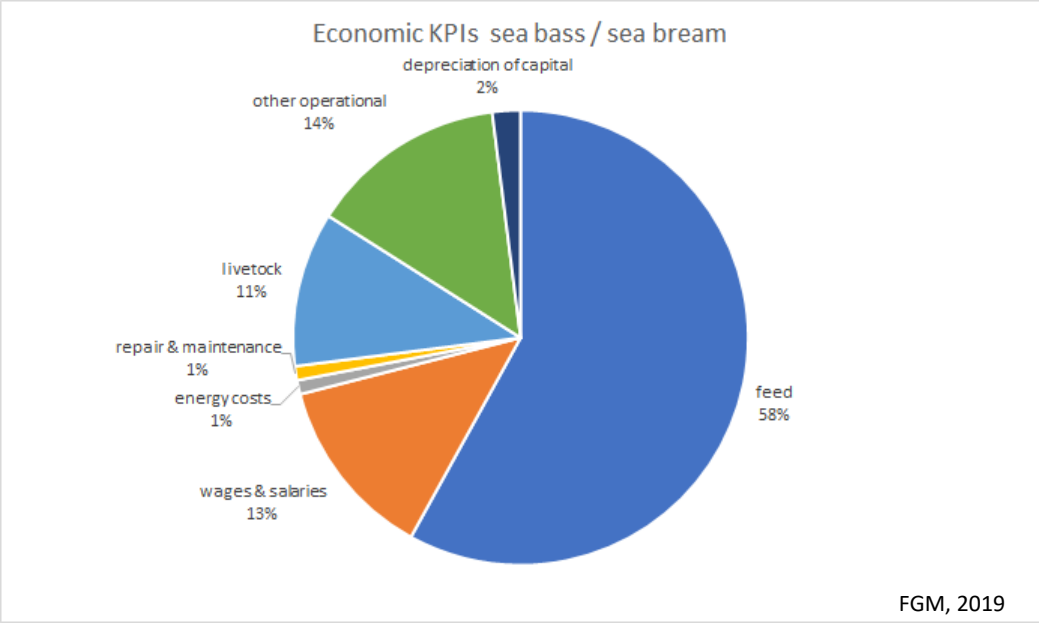
Type of data available (2)

Business economics model

- income
- feed costs
- cost of juveniles
- labour costs
- annual depreciations
- accumulated debt

- interest
- total costs
- profit
- GVA



FGM, 2019

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Type of data available (3)

Vulnerability assessment & Adaptive measures (WP5)

- **Impact Categories**
  - Biological
  - Production
  - Ecosystem/ environmental
  - Socio-economic

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What users?

- Farmers (old and new)
- Administrators of Zones for Organized Development of Aquaculture
- Administrators of producers organizations
- Regional/ National authorities
- Other stakeholders

Greek administrative regions

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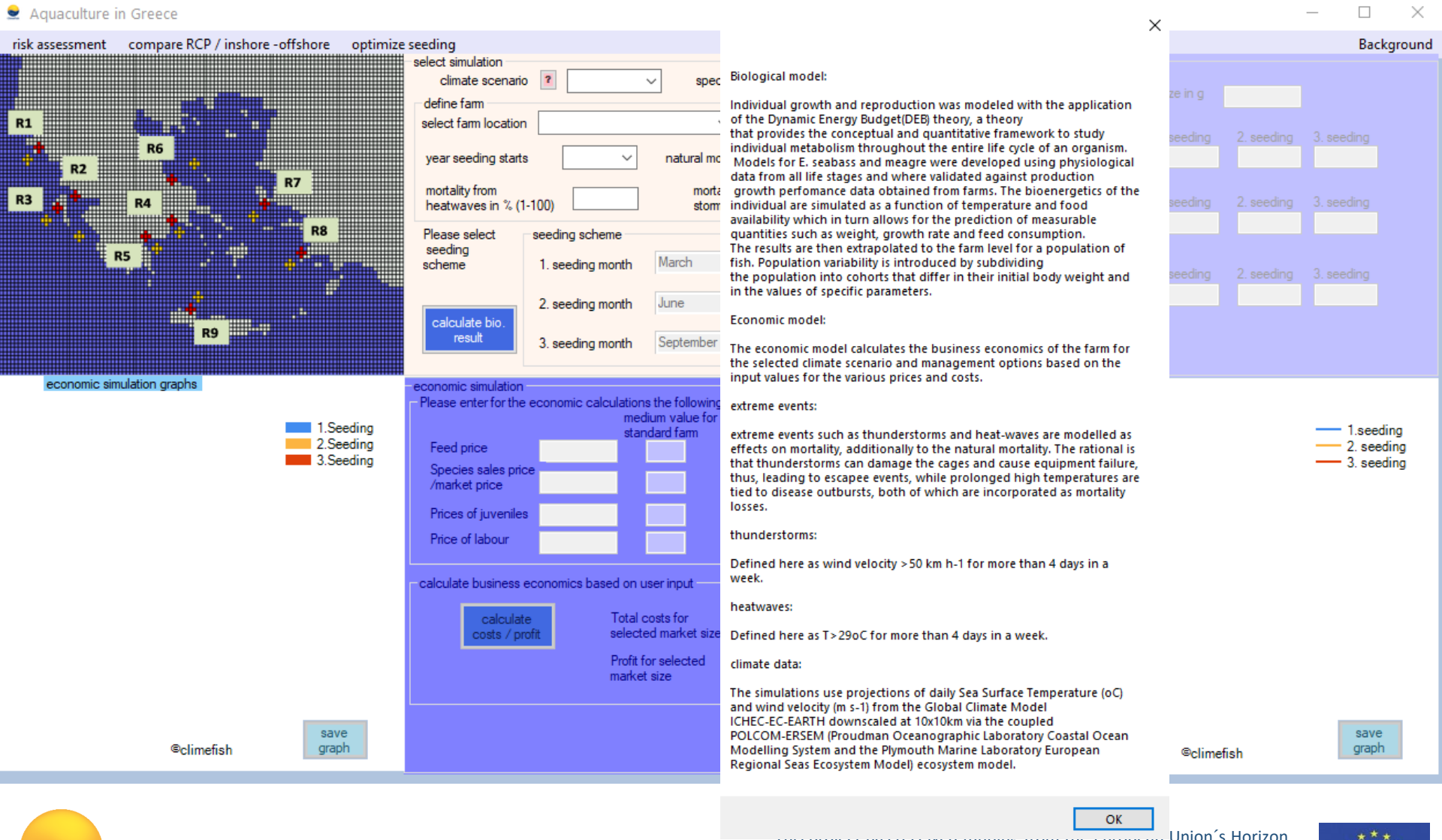
A description of the DSS



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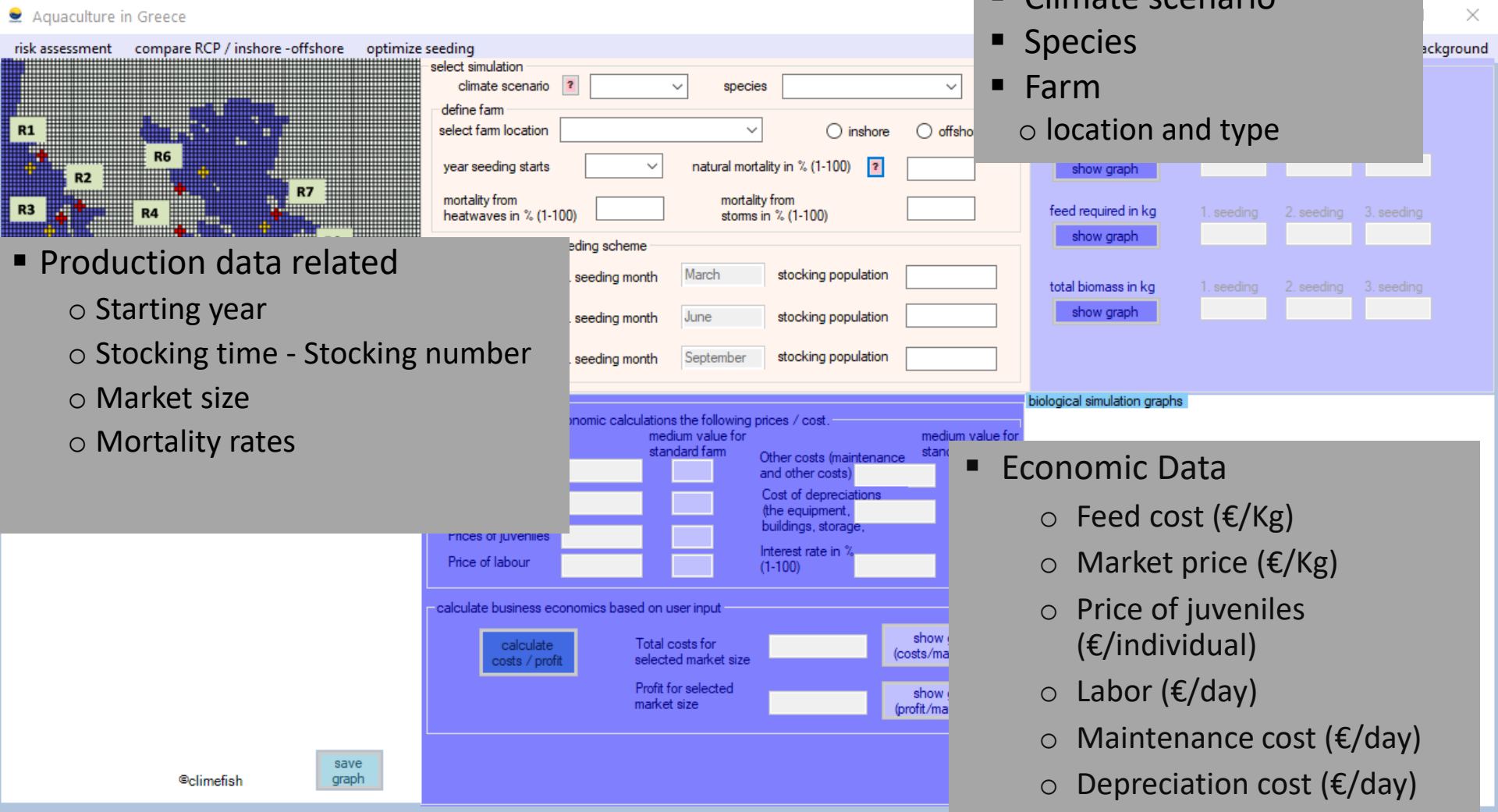
A description of the DSS

- **User defined parameters**



- Climate scenario
- Species
- Farm
  - location and type

- Production data related
  - Starting year
  - Stocking time - Stocking number
  - Market size
  - Mortality rates

- Economic Data
  - Feed cost (€/Kg)
  - Market price (€/Kg)
  - Price of juveniles (€/individual)
  - Labor (€/day)
  - Maintenance cost (€/day)
  - Depreciation cost (€/day)
  - Interest rate (%)

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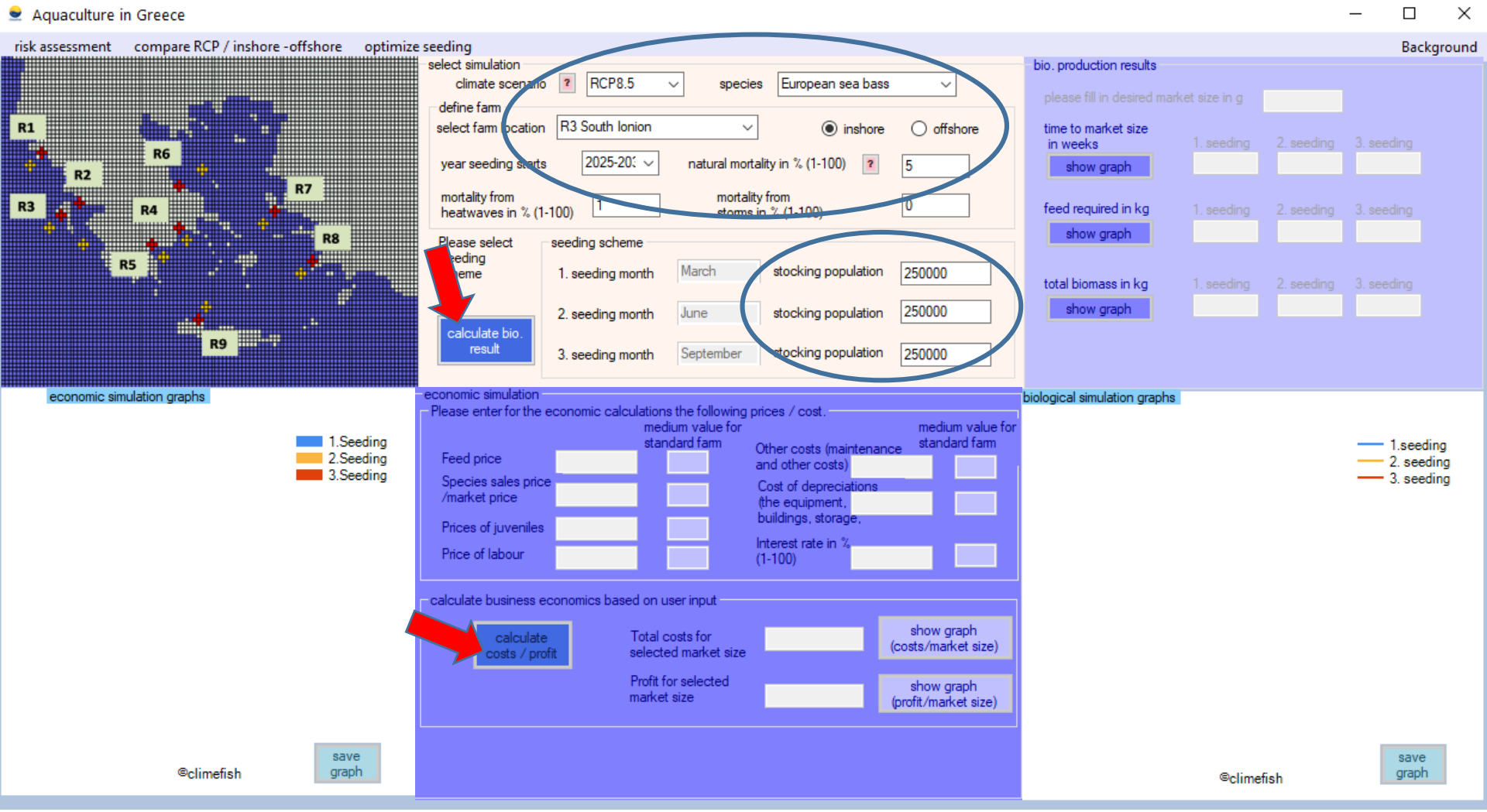

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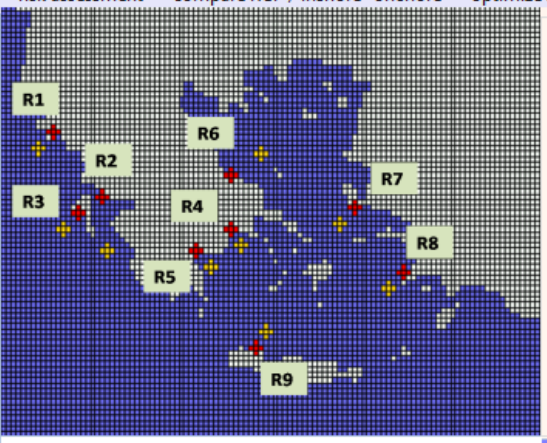
Aquaculture in Greece

risk assessment | compare RCP / inshore -offshore | optimize seeding | Background



select simulation

climate scenario: RCP8.5 | species: European sea bass

define farm

select farm location: R3 South Ionion | inshore | offshore

year seeding starts: 2025-20 | natural mortality in % (1-100): 5

mortality from heatwaves in % (1-100): 1 | mortality from storms in % (1-100): 0

Please select seeding scheme | calculate bio. result

seeding scheme

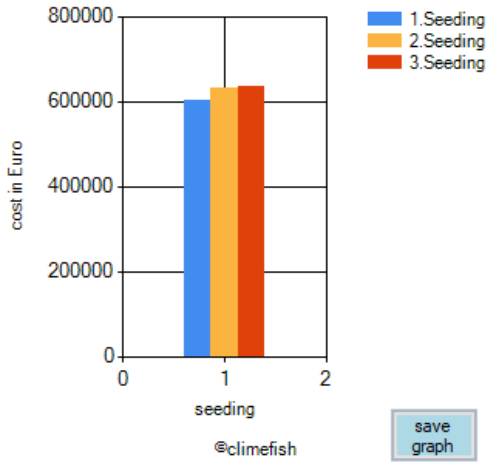
1. seeding month	March	stocking population 250000
2. seeding month	June	stocking population 250000
3. seeding month	September	stocking population 250000

bio. production results

please fill in desired market size in g: 800

	1. seeding	2. seeding	3. seeding
time to market size in weeks (show graph)	123	117	117
feed required in kg (show graph)	432,206.5	451,773.9	440,719.6
total biomass in kg (show graph)	194,067.6	189,730.8	187,783.4

Costs per selected market size



save graph

economic simulation

Please enter for the economic calculations the following prices / cost.

		medium value for standard farm			medium value for standard farm
Feed price	1.05	1.15	Other costs (maintenance and other costs)	47.5	47.5
Species sales price /market price	6.0	6.44	Cost of depreciations (the equipment, buildings, storage,	8.73	8.73
Prices of juveniles	0.23	0.23			
Price of labour	37.41	37.41	Interest rate in % (1-100)	2	2

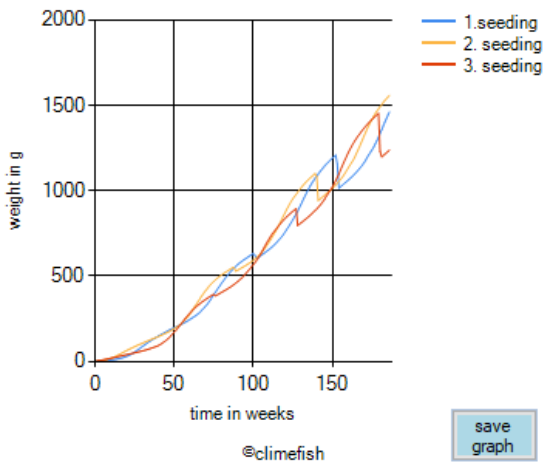
calculate business economics based on user input

calculate costs / profit

Total costs for selected market size: 1,870,791.9 | show graph (costs/market size)

Profit for selected market size: 1,558,698.7 | show graph (profit/market size)

Mean Individual weight in g per time in weeks



save graph

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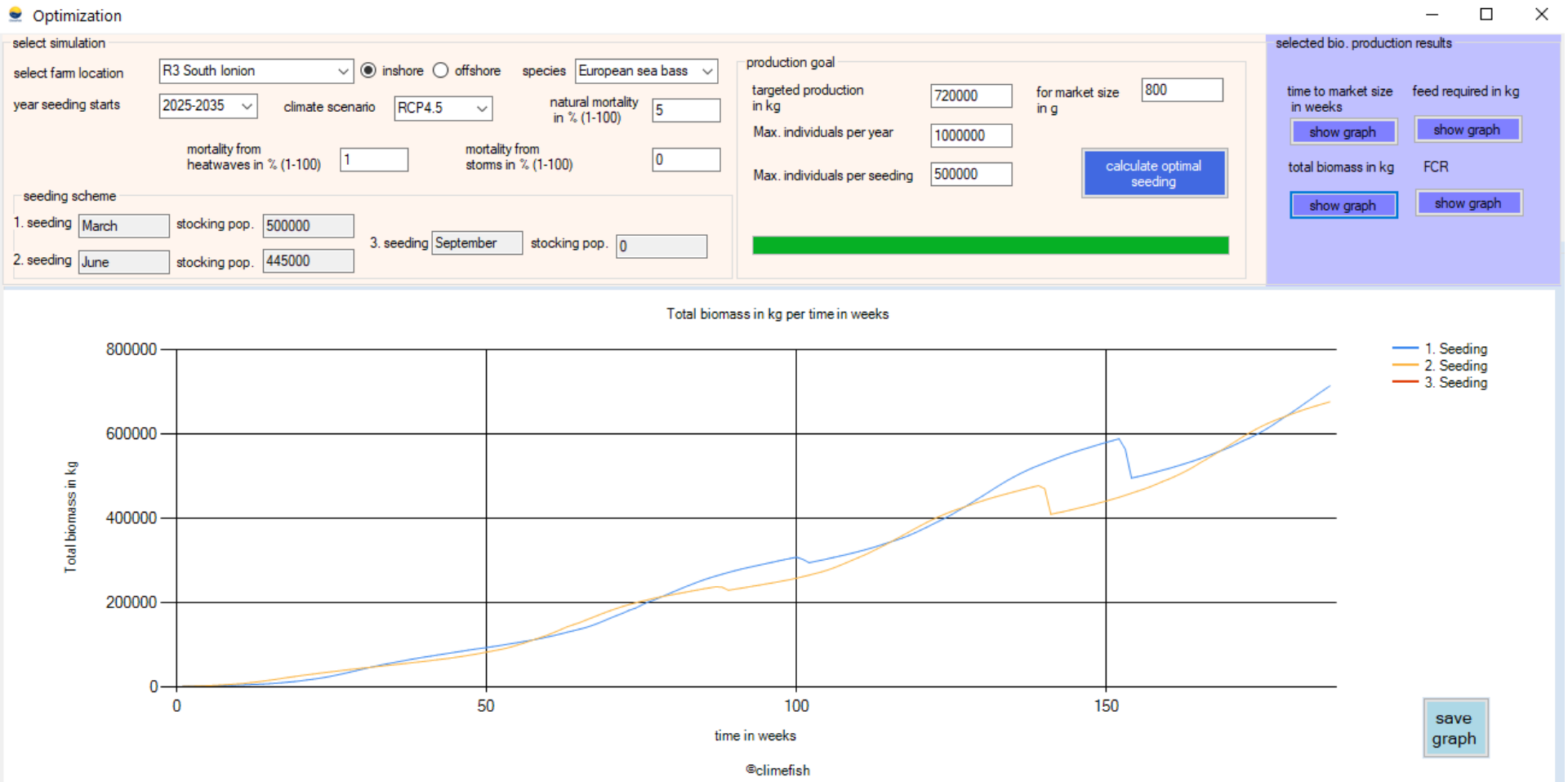
Some more tools…(1)

- **Seeding optimization**

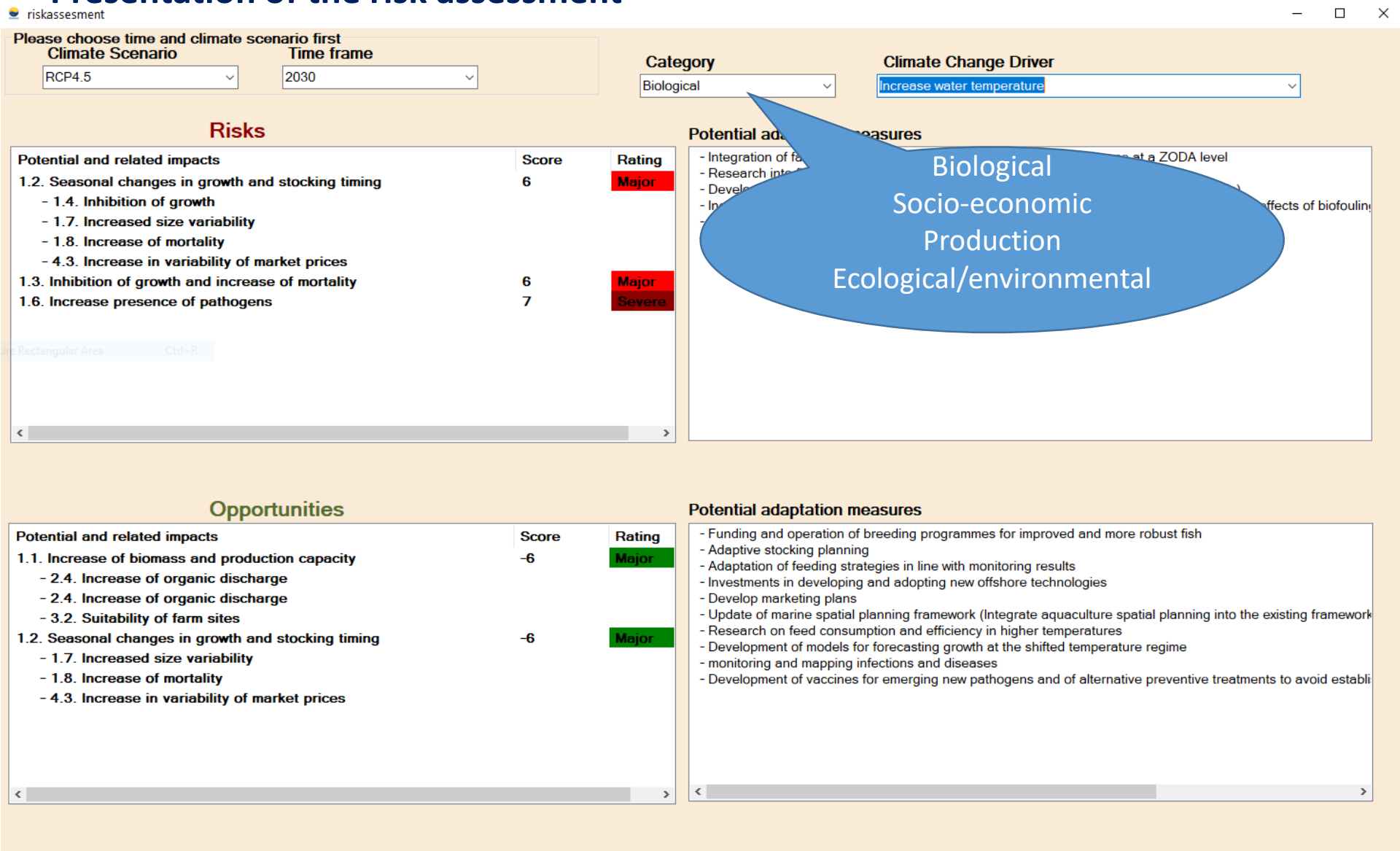


Some more tools… (2)

- **Compare RCP scenarios**
- **Inshore / offshore**

Some more tools… (3)

- **Presentation of the risk assessment**



Next steps

- On line version
- Include model for gilthead seabream
- Update model / results with more CC drivers

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Thank you for your attention!

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