UiT

THE ARCTIC UNIVERSITY OF NORWAY

ClimeFish

Freshwater aquaculture and climate change

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V4 Freshwater Aquaculture Conference, Szarvas 26th of April 2018

UNIVERSITY OF TROMSØ

ClimeFish overall objective:

ClimeFish will support sustainable fisheries, enable an increase in European aquaculture production, facilitate employment and regional development in the sectors, and develop forecasting and management tools for adapting to climate change; all in co-creation with stakeholders

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

ClimeFish impact generators

- Forecasting models for fish production
- Guidelines for making Climate Adaptation Plans for fisheries and aquaculture - European voluntary standard (CWA)
- The ClimeFish Decision Support Framework including a Decision Support System

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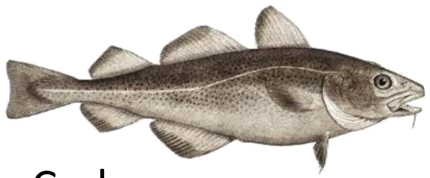
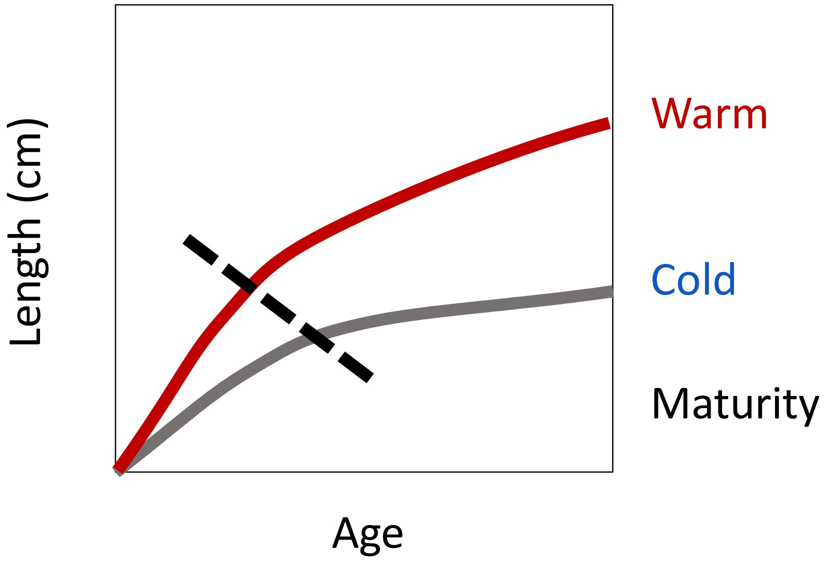
Fish grow faster and mature earlier due to warming



Cod

Salmon



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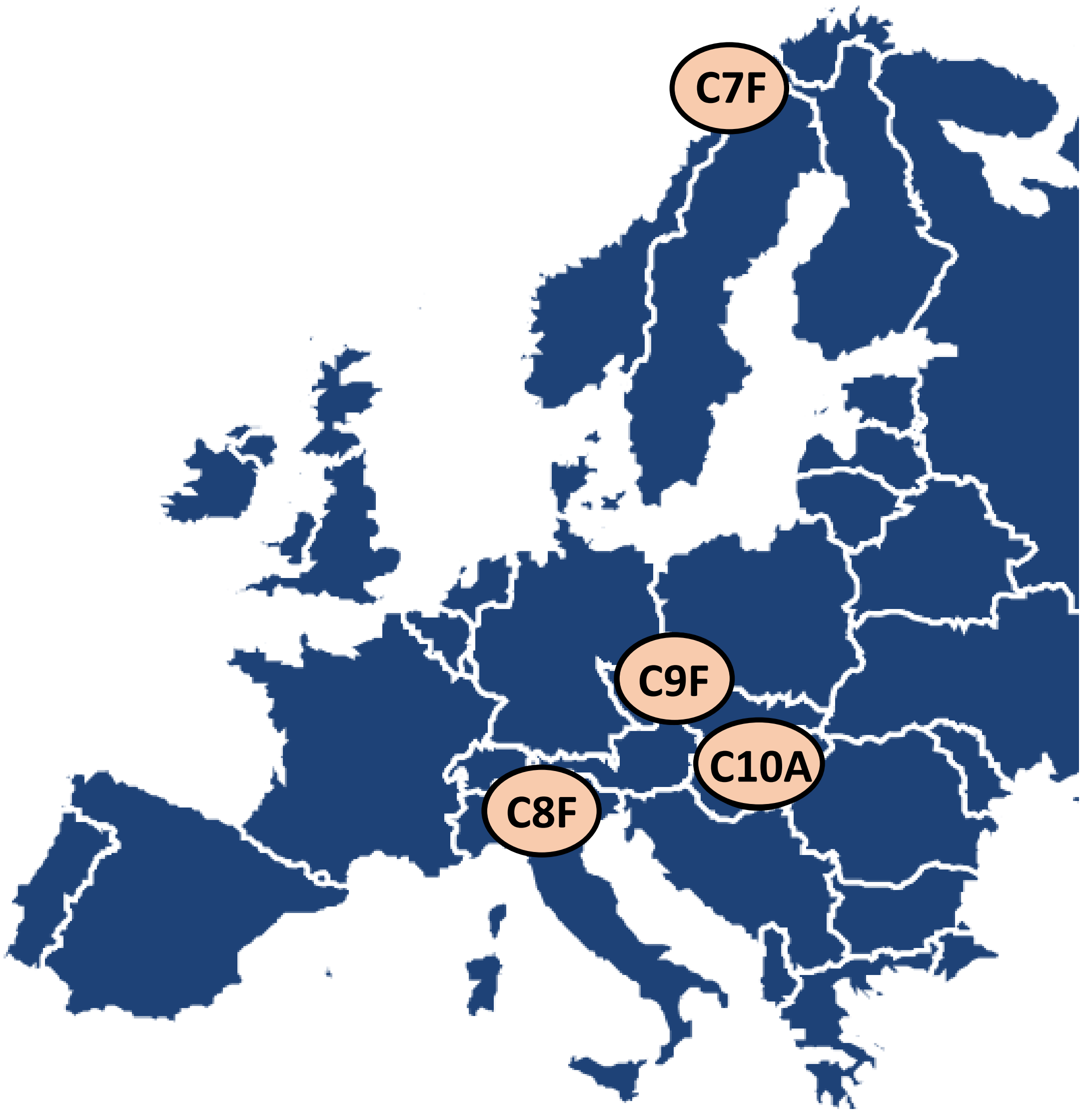
Lakes and Ponds case studies



C7F North Norwegian lakes
- Brown trout, arctic charr, whitefish, vendace

C8F Italian Lake Garda
- Whitefish, arctic charr

C9F Czech Republic lakes
- Catfish, pike-perch, carp, whitefish

C10A Hungary
- Carp, catfish

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At present fishing effort, whitefish catches will increase with moderate temperature increase.

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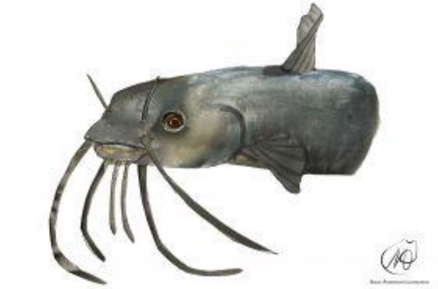
Emerging species in lakes and reservoir fishery in central Europe

Pikeperch (*S. lucioperca*) emerging

Wels catfish (*S. Glanis*) emerging just now



Carp (*C. Carpio*) emerging in southern Europe

Perch (*P. Fluviatilis*) neutral, but interesting for modelling

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ClimeFish co-creates project outcomes with stakeholders

Industry:

Hungarian Aquaculture and Fisheries Inter-Branch Organization MA-HAL

HUNATiP Hungarian mirror of EATIP

Policy makers:

Ministry of Agriculture

Water authority

NGO:

Birdlife Hungary

Research:

HAKI

H2020 projects

Inter-Reg, EMFF

Multi-stakeholder platforms:

Climate-ADAPT

Aquaculture Advisory Council

European case

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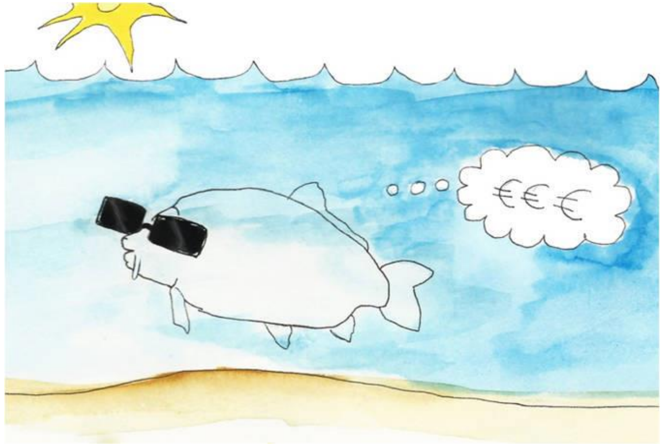
Hungarian pond aquaculture



Farmer needs and questions:

- Feeding and stocking strategy to maximize production
- Optimize water management
- How often will critical oxygen levels occur?
- Worth investing in monitorisystems, aerators?

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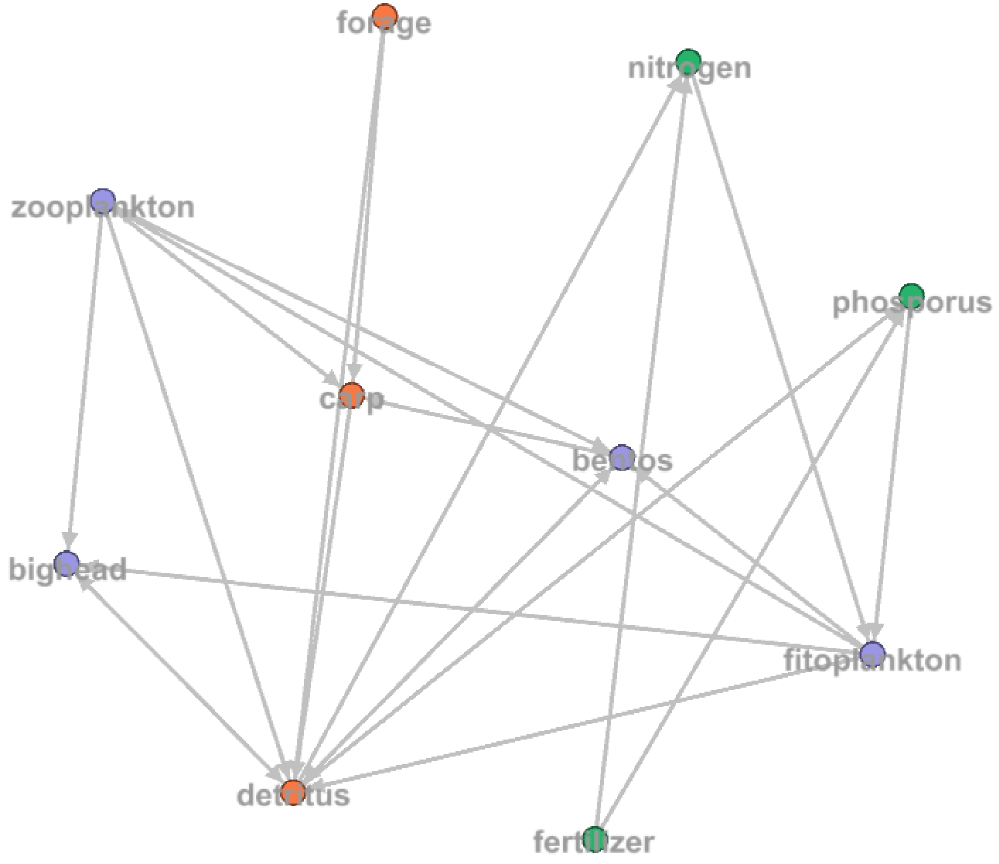
The food web model includes basic physical relations:

- Temperature → **fish growth**
- Temperature → oxygen
- Phytoplankton biomass → oxygen
- Oxygen diffusion from the air →oxygen
- Oxygen → **fish growth**
- Oxygen → zooplankton growth
- Temperature → phytoplankton growth
- Solar radiation → phytoplankton growth
- Temperature → zooplankton growth



The model is more optimistic about climate change than reality

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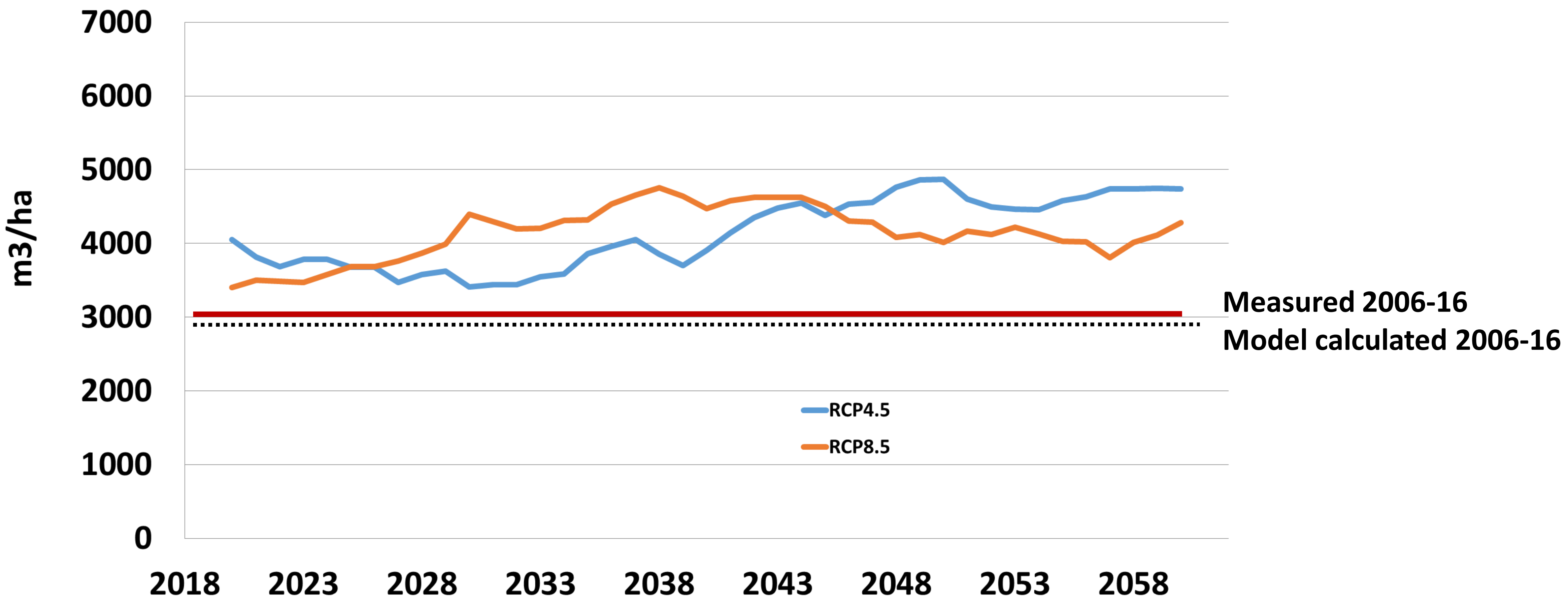
Increase in supplementary water use in the summer period due to evaporation



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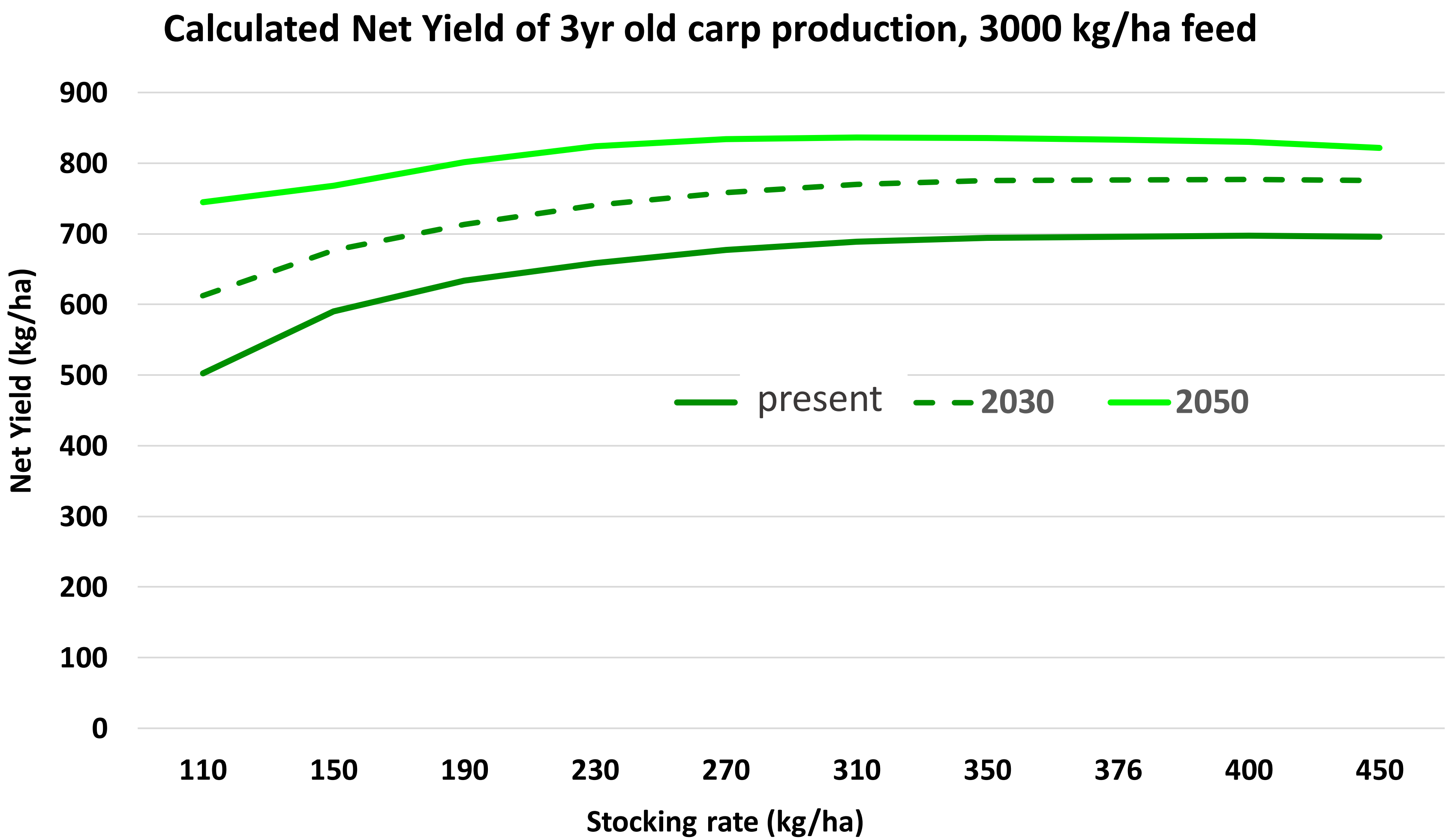
Extensive farms profit more from warming and increase in primary production



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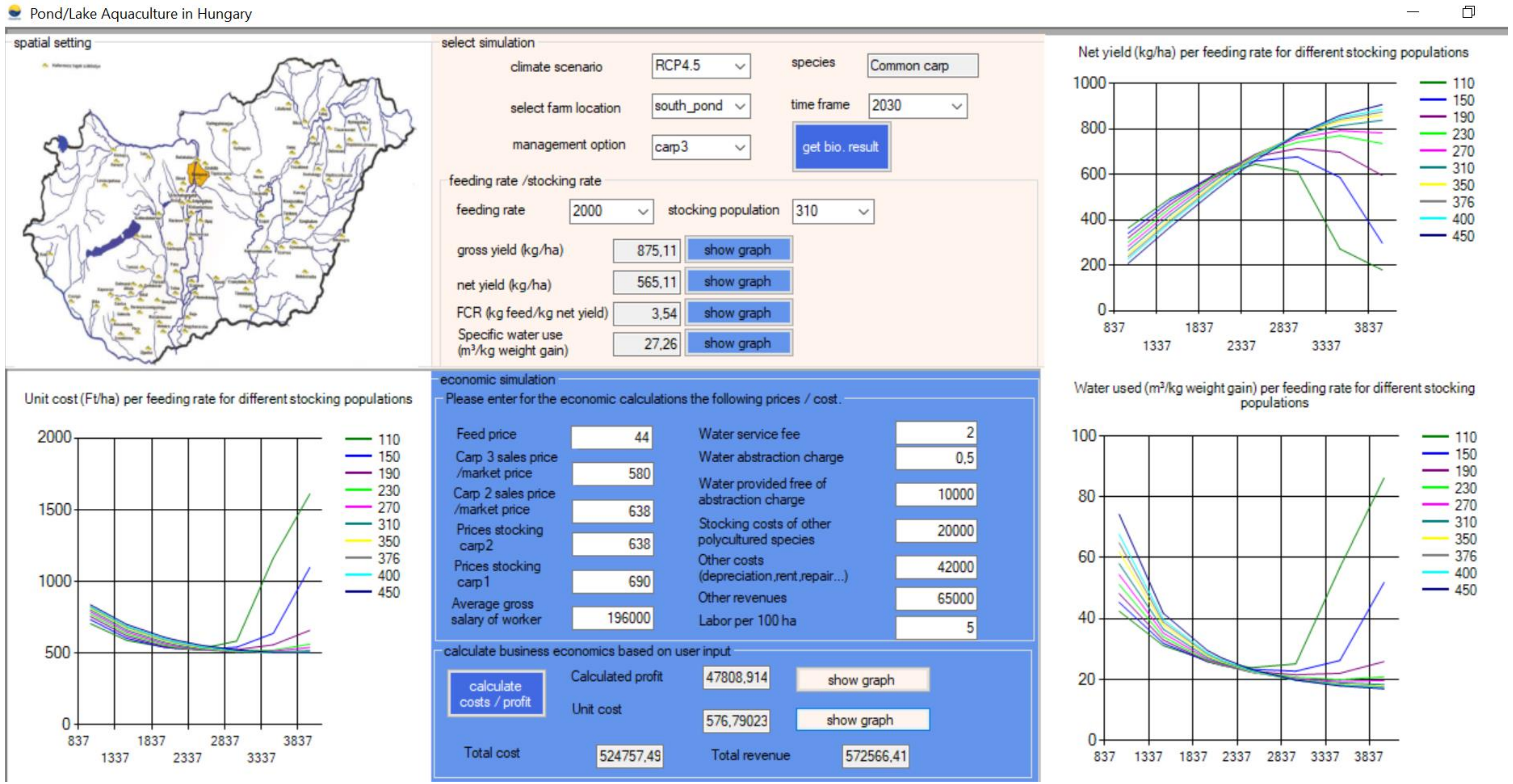
Pond/Lake Aquaculture in Hungary
spatial setting
select simulation
climate scenario
RCP4.5
species
Common carp
select farm location
south_pond
time frame
2030
management option
carp3
get bio. result
feeding rate /stocking rate
feeding rate
2000
stocking population
310
gross yield (kg/ha)
875,11
show graph
net yield (kg/ha)
565,11
show graph
FCR (kg feed/kg net yield)
3,54
show graph
Specific water use (m³/kg weight gain)
27,26
show graph
Net yield (kg/ha) per feeding rate for different stocking populations
Unit cost (Ft/ha) per feeding rate for different stocking populations
economic simulation
Please enter for the economic calculations the following prices / cost.
Feed price
44
Carp 3 sales price /market price
580
Carp 2 sales price /market price
638
Prices stocking carp2
638
Prices stocking carp1
690
Average gross salary of worker
196000
Water service fee
2
Water abstraction charge
0,5
Water provided free of abstraction charge
10000
Stocking costs of other polycultured species
20000
Other costs (depreciation,rent,repair...)
42000
Other revenues
65000
Labor per 100 ha
5
calculate business economics based on user input
calculate costs / profit
Calculated profit
47808,914
show graph
Unit cost
576,79023
show graph
Total cost
524757,49
Total revenue
572566,41
Water used (m³/kg weight gain) per feeding rate for different stocking populations
110
150
190
230
270
310
350
376
400
450
837
1337
1837
2337
2837
3337
3837

The stakeholder meeting in Szarvas, 23rd of April 2018

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Comissão Europeia

http://climefish.eu

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THANK YOU!

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