



Blu

Piloting innovative services for Marine Research & the Blue Economy

loud

PerfeCt - Performance of Aquaculture under Climate change

Ines Haberle

Marija Purgar

Damir Kapetanović

Jadranka Pečar Ilić

Nina Marn

Tin Klanjšček



Tamara Djerd

Domagoj Hackenberger Kutuzović

Bruno Čaleta

Branimir Hackenberger Kutuzović



Aquaculture is key for sustainable development



Un's Sustainable Development Goals



Figure 6. Mission Starfish 2030 ©European Union, 2020

EU Mission Starfish



EU Farm to Fork strategy



New species for EU aquaculture

DIVERSIFY project



Blu loud

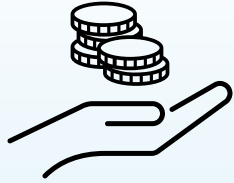
Stakeholders

Aquaculture farmers

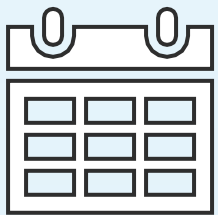
Aquaculture investors

Policy Makers

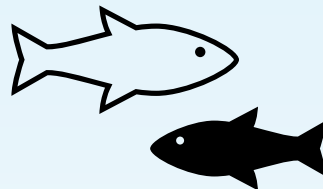
How much will I need to invest?



How fast will my fish grow?

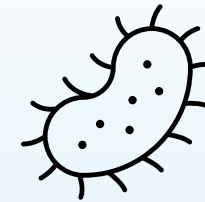


Which fish should I farm?



What will the future bring





Will disease be a problem?



How can policies help?



So what is PerfeCt?

-  *geospatial web application*
-  *forecast the effects of climate change on aquaculture*
-  *link between R&D and industry*
-  *science-based results → informative performance factors*

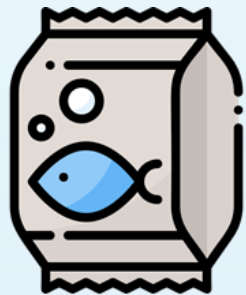
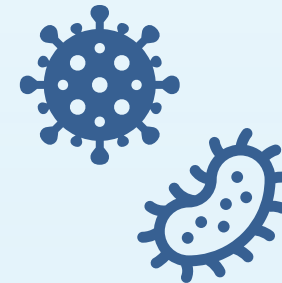


image: Flaticon.com

food conversion ratio



time-to-market

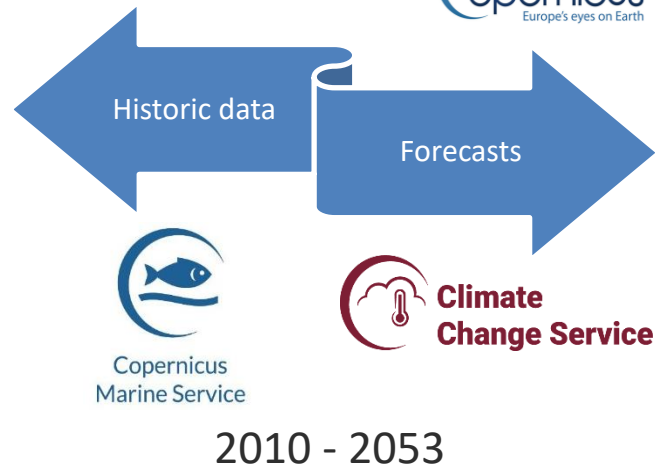


risk of disease

The Perfect Platform

Data

1. Temperature



2. EEA 10km grid

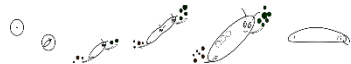


3. Fish farm locations / MPAs



4. Species parameters

Add-my-Pet

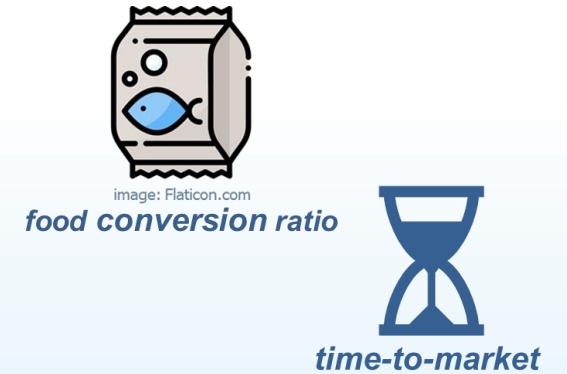
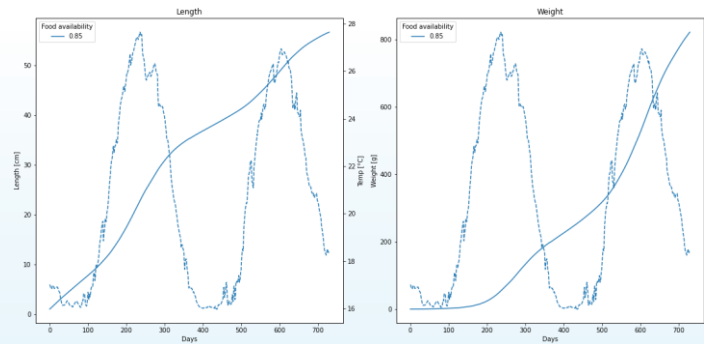
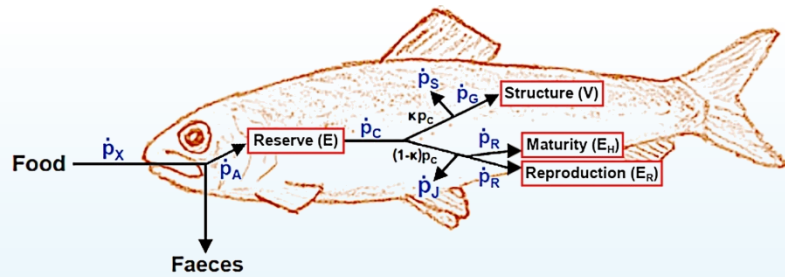


2TB raw → 10 GB →

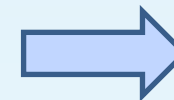
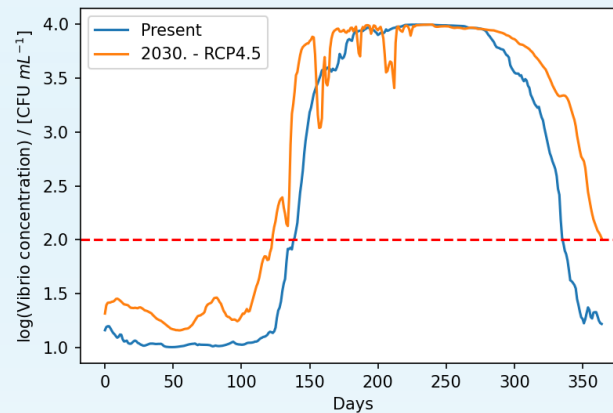


PerfeCt modules

Dynamic Energy Budget model



Vibrio growth model





Blu loud

The PerfeCt Platform – functionality

User input

Select

- Location
- Species
- RCP Scenario

Data retrieval

- Daily temperatures 2010 - 2052
- Species parameters (AmP open database)

DEB model

Simulations of fish growth

- Calculate food conversion ratio and time to market

Vibrio model

Simulations

- Identify days of critical *Vibrio* abundance >100CFU/mL

Integrated through

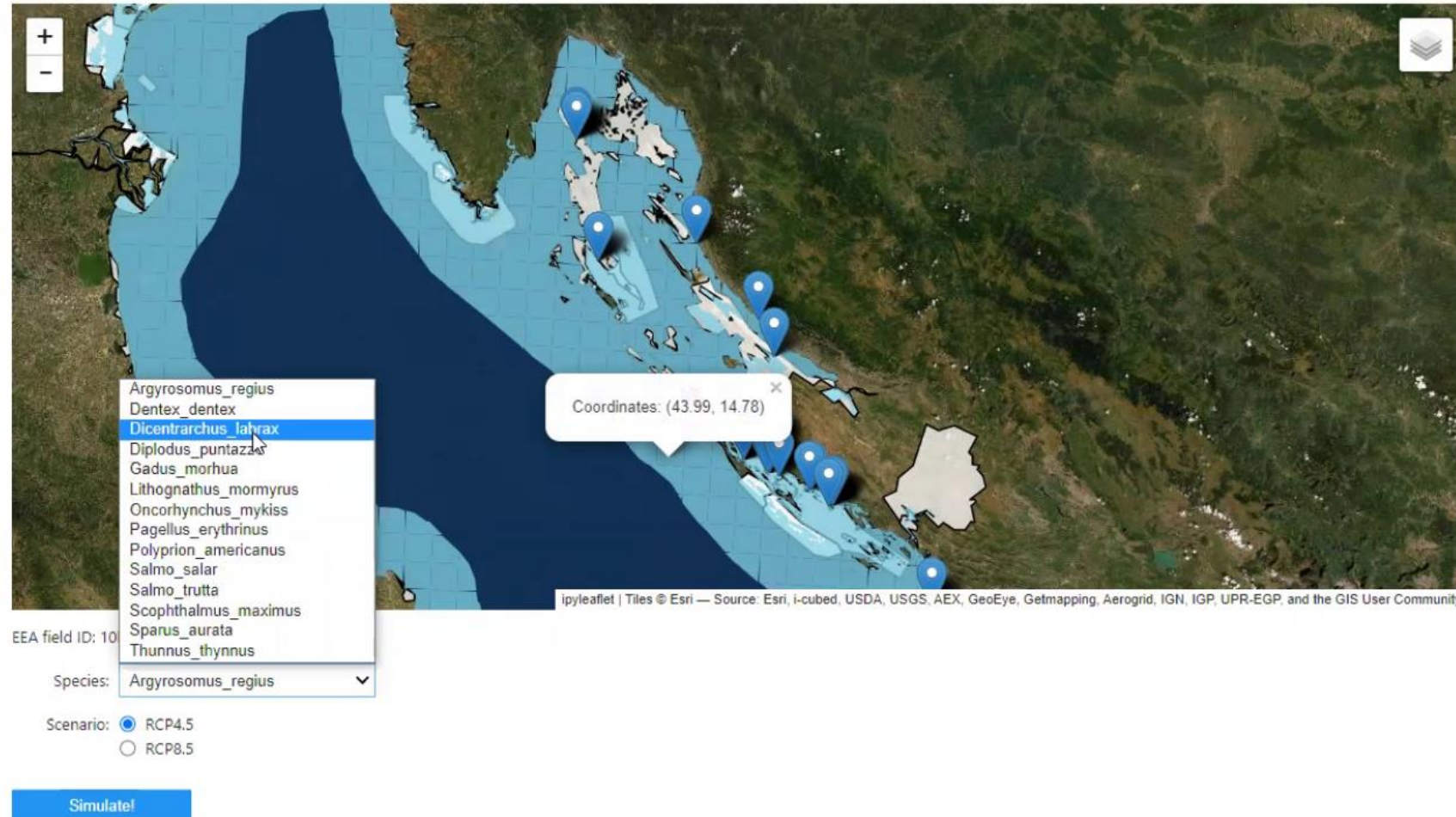


Welcome to PerfeCt!

Instructions:

1. Click on an existing aquaculture farm denoted by blue markers or choose a blue square as a new farm location in the Mediterranean (zoom in for easier selection).
2. Choose a fish species and a climate change scenario for which you would like to see the model simulation results.
3. Click the Blue "Simulate!" button.
4. Wait up to 40 seconds to see the simulation results.

Feel free to explore around the Mediterranean!



Coordinates: (43.99, 14.78)

Species selection dropdown:

- Argyrosomus_regius
- Dentex_dentex
- Dicentrarchus_labrax**
- Diplodus_puntazzus
- Gadus_morhua
- Lithognathus_momyrus
- Oncorhynchus_mykiss
- Pagellus_erythrinus
- Polyprion_americanus
- Salmo_salar
- Salmo_trutta
- Scophthalmus_maximus
- Sparus_aurata
- Thunnus_thynnus

EEA field ID: 10

Species: Argyrosomus_regius

Scenario: RCP4.5 RCP8.5

Simulate!



Welcome to PerfeCt!

Instructions:

1. Click on an existing aquaculture farm denoted by blue markers or choose a blue square as a new farm location in the Mediterranean (zoom in for easier selection).
2. Choose a fish species and a climate change scenario for which you would like to see the model simulation results.
3. Click the Blue "Simulate!" button.
4. Wait up to 40 seconds to see the simulation results.

Feel free to explore around the Mediterranean!



EEA field ID: 10kmE470N233

Species:

Scenario: RCP4.5
 RCP8.5





Blu loud



Species:

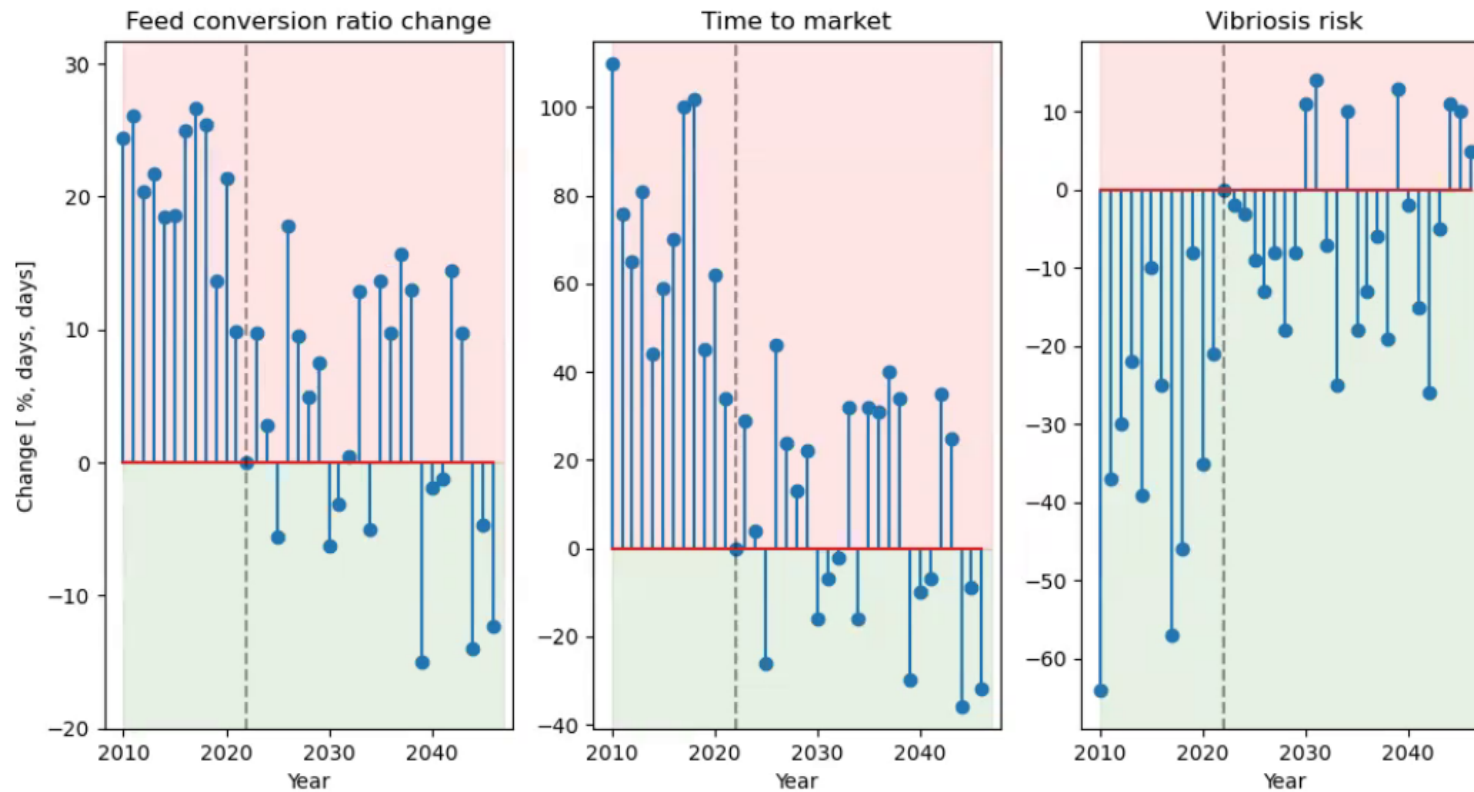
Scenario: RCP4.5

RCP8.5




Simulate!


Figure 4

Dicentrarchus labrax - Simulation results for location (43.99, 14.78) - RCP4.5



Further development

-  User inputs: reference year, time frame, local data
-  Higher resolution
-  Improved *Vibrio* model

-  **User feedback**



Blu

Piloting innovative services for Marine Research & the Blue Economy

loud

Thank you!



https://www.youtube.com/watch?v=Wxcp_1iJSXg

✉ ihaberle@irb.hr



Blue-Cloud has received funding from the European Union's Horizon Programme call BG-07-2019-2020, topic: [A] 2019 - Blue Cloud services, grant Agreement number 862409.