



CS6

Spain  
Marine aquaculture.  
Mussels.



Industry partner: PROINSA



Research partner: CSIS



Stakeholder: Marine aquaculture industry, public administration

## Challenge

Mussel aquaculture is one of the most environmentally sustainable forms of animal protein production. Despite **low carbon footprint**, some emissions linked to mussel metabolism, such as **respiration and shell formation** (calcification), can be significant over the culture period.

Farmers are also seeking ways to optimise **mussel growth and flesh yield**, both of them relying heavily on **environmental conditions** (temperature, salinity, pH, food availability, and cultivation technology). Climate change, especially **ocean acidification**, is disrupting these conditions. This could cause reduced growth rates and a lower nutritional quality.



**Mytilus galloprovincialis**,  
or Mediterranean mussel

# Proposed solution

## S6: Digital tool to monitor the performance and carbon footprint of bivalve production

The tool will:

- Forecast the combined effects of multiple climate stressors, such as warming, acidification, and food availability
- Estimate the current and future mussel growth and carbon footprint under varying environmental scenarios
- Support the implementation of mitigation measures, such as optimizing site selection, seeding time, seed size, and harvest strategy
- Guide adaptation strategies, including selecting less corrosive farming sites, adjusting culture cycles based on temperature, pH, and food conditions, and using anti-predator netting for seed protection



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