C15A – Mussel aquaculture in the Adriatic Sea (reference CS)

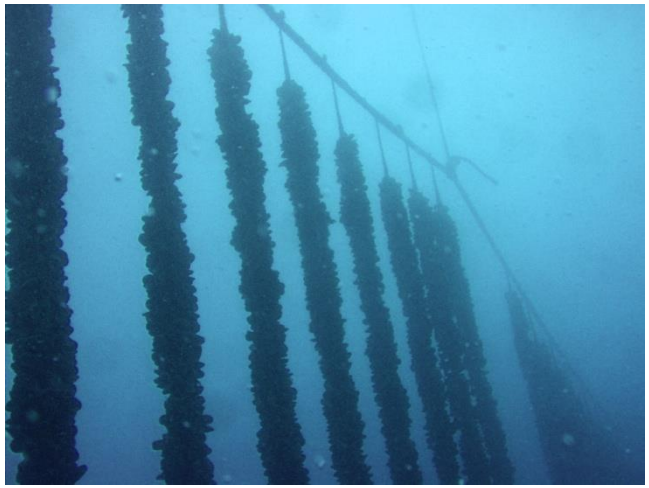
2020 International Forum on the Effects of Climate Change on Fisheries & Aquaculture

25-26 February 2020, Rome

ClimeFish

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

Case study description



Habitat: Coastal

Geographical boundaries: Northern basin of the Adriatic Sea

Species:

Mediterranean mussels (*Mytilus galloprovincialis*) > 50000 metric tons y^{-1}

Stakeholders:

Mussel farmers and their associations, regions (AZA planning), national level (MSP implementation)

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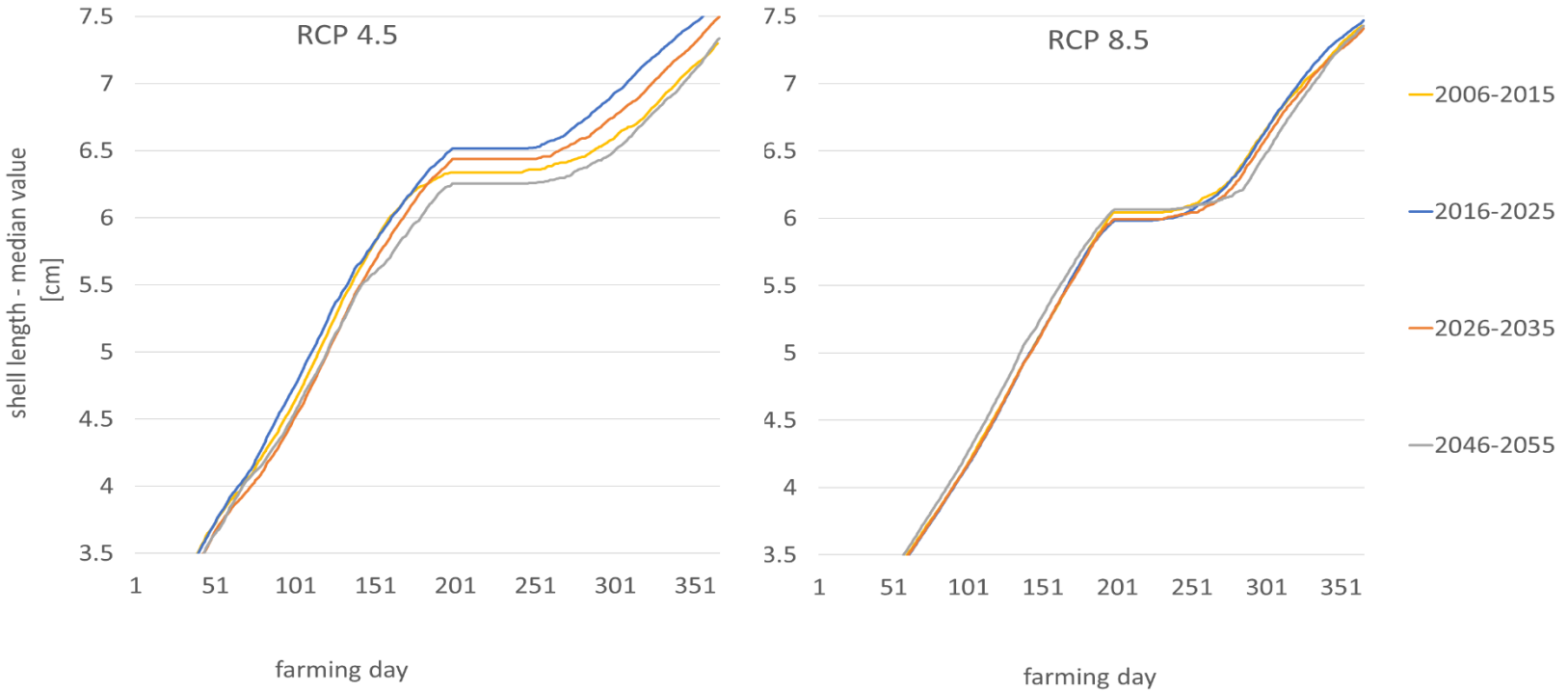
Biological forecasting – mussel growth



Time to commercial size [days]	RCP4.5			RCP8.5		
	Median	1st quartile	3rd quartile	Median	1st quartile	3rd quartile
2010 - 2015	116	93	148	143	129	167
2016 - 2025	111	88	153	142	128	166
2026 - 2035	121	92	159	142	125	170
2046 - 2055	120	93	176	135	122	171

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Based on model results:

Opportunities: Decrease of the minimum Time required to Reach the Commercial Size (TRCS) of 8 days under RCP8.5, is due to the higher number of days falling within the optimal thermal regime of this species under this scenario. **A change in this direction can produce a positive impact on the operational costs of farming (working days).**

Risks: Increases of Time required to Reach the Commercial Size (TRCS) of 5 days to 4 weeks, under RCP4.5, **can produce a negative impact on the operational costs of farming (working days).**

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Non-modeled threats

1: **Increase in storm events** (inducing major damages to farm socks and cables)

2: **Changes in the timing of natural recruitment** (could be an opportunity)

3: **Mussels detachment** (summer heat waves)

4: **Natural predation** (increase in predation pressure due to a change in the trophodynamics)

5: **Lower food availability** (e.g. in 2017, when the Po river plume presented a more limited extension in summer, affecting farms located in the lower part of the Northern Adriatic area

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Adaptation measures

The strategic plan for aquaculture development in Italy (2014-2020) (MiPAAF, 2014) **included considerations regarding effects of climate changes on shellfish aquaculture**, mainly increase in water temperatures and intensification of extreme events.

The first version of the national plan for adaptation to CC (CMCC, 2017) – produced for public consultation in July 2017 - **presented a focus on the potential effects of CC on Italian shellfish aquaculture, highlighting the importance of a planning of aquaculture space** contextualized in the expected climate scenarios.

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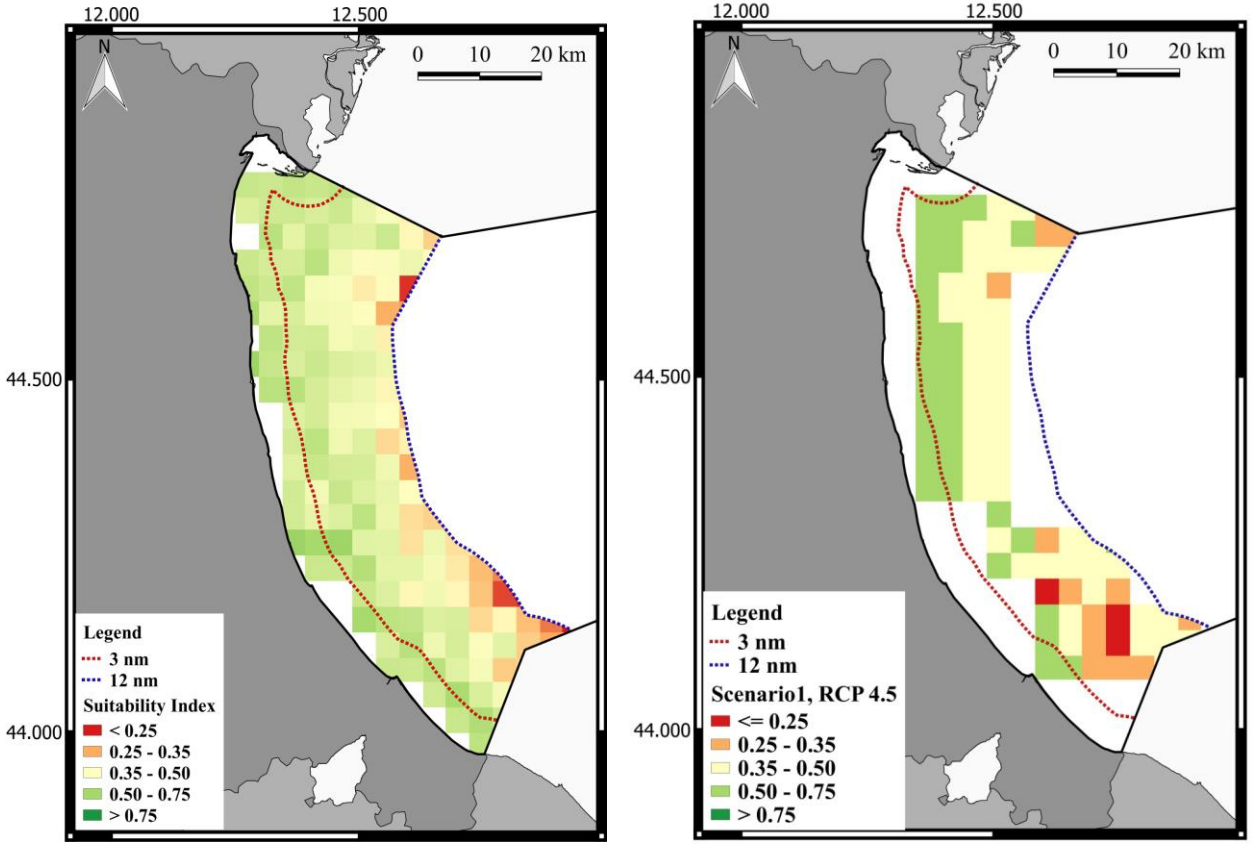
Impact on local level



Current VS future suitability of farming areas?
Consideration in MSP?
(refs Brigolin et al., 2017; Barbanti et al., 2018)

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