Where

Emilia-Romagna, Italy

Issue types(s)

Potential use conflicts of aquaculture with other activities, i.e. fishery and navigation.

Specific Issue(s):

Saturation of the area within 3 nm from the shore. Need for product diversification: oyster farming is being introduced. Transition towards new production technologies in order to lower the environmental impact: this may require the siting of farms in deeper areas.

Case study:

Shellfish culture in Emilia-Romagna, Adriatic Sea, Italy

Objective(s):

- to identify the most suitable sites for off-shore mussel culture in the coastal area comprised between 3 and 12 nm from the shore;

- to assess the potential for co-farming mussels and Pacific oysters.

Tool(s):

Ecophysiological models for Mediterranean mussel and Pacific oyster. FiCIM model for estimation of local environmental impact. Free GIS, i.e. QGIS. BLUEFARM-2.

How tool(s) has/have been implemented

We used individual ecophysiological models for Mediterranean mussel and Pacific oyster, forced by remotely sensed Earth Observation of Chlorophyll a and Sea Surface Temperature downloaded from Copernicus Marine Environment Monitoring Services (http://marine.copernicus.eu/), for mapping the potential productivity of both species at 1 Km resolution. The FiCIM model, originally developed for estimating the impact of finfish farms on benthic environment, was used for mapping the impact of mussel biodeposition. These maps were combined with other criteria and constraints using BLUEFARM-2, a tool which implements a Spatial MultiCriteria Evaluation methodology already tested in aquaculture.

Results:

BLUEFARM-2 allowed us to map a suitability index ranging from 0 (impossible to locate a farm) to 1 (highly suitable area). In this case study, we took into account the following criteria: number of days to reach the market size for mussels and oysters, extension of areas moderately impacted by shellfish biodeposition; significant wave height, distances from ports and motorways. The results are presented in Fig.1, which shows the suitability maps obtained giving equal weight to both mussel and oyster productivity indicators.

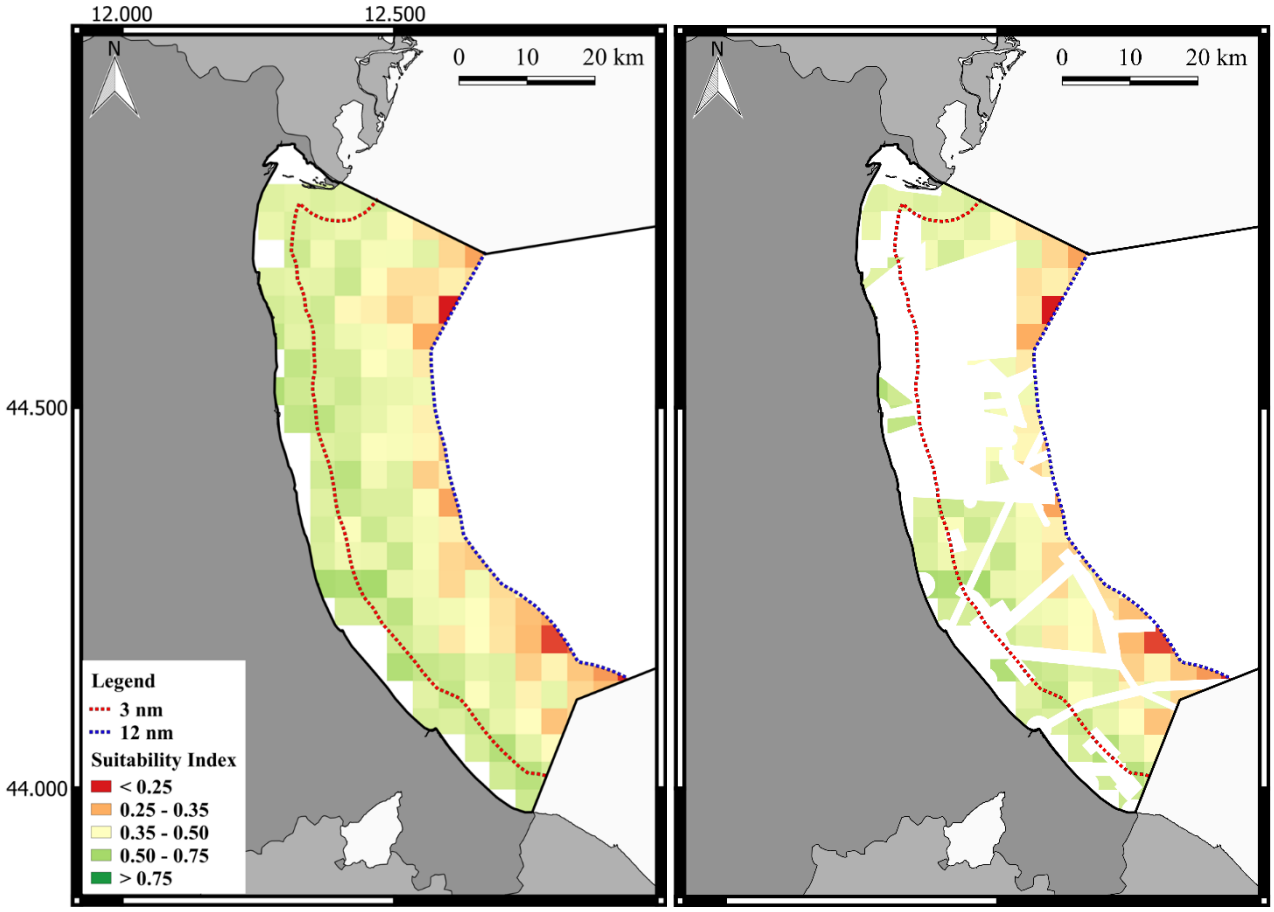

Fig. 1. Map of suitability index for the case study area (left) and final map, obtained by overlapping constraints to the establishment of a shellfish farm (right).

Links:

AquaSpace D4.2 at aquaspace-h2020.eu on Library/Reports page

Reference

Brigolin, D., E. M. D. Porporato, G. Prioli & R. Pastres (2017). Making space for shellfish farming along the Adriatic coast. ICES Journal Of Marine Science 74(6): 1540-1551. doi: 10.1093/icesjms/fsx018

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