

Maximizing yield by reducing discards: a spatial approach

Vilela, R., Pennino, M. G., Bellido, J.M

Instituto Español de Oceanografía (IEO). Centro Oceanográfico de Murcia. C/ Varadero 1. San Pedro del Pinatar. 30740. Murcia. Spain.
raul.vilela@mu.ieo.es

Introduction:

Current fisheries management measures include the automatic data collection for control and surveillance, by means of electronic logbooks, deck cameras or on-board observers.

Improvement of communications from the vessel allows the real-time transmission and analysis of fishing data.

Objectives:

Development and assessment of a real-time unsupervised and automatic statistical tool aiming to:

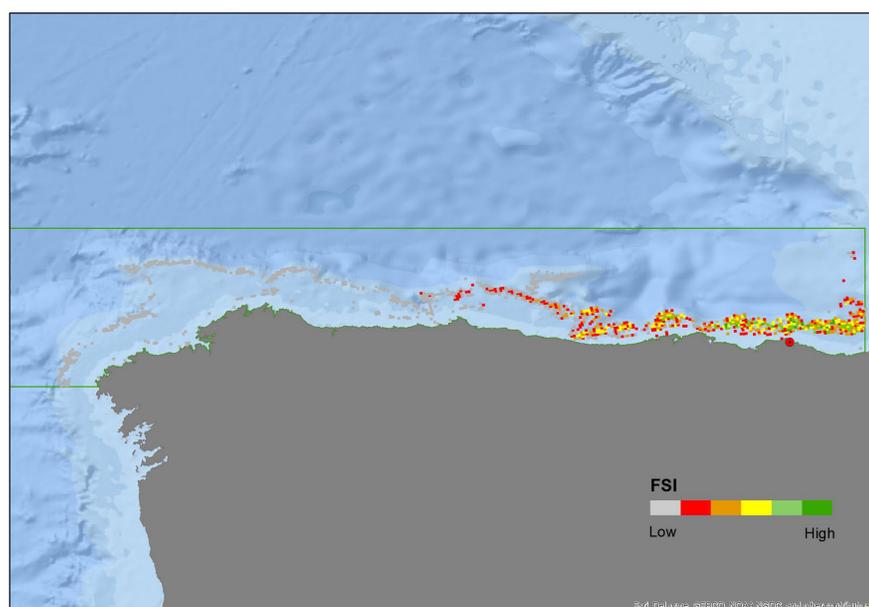
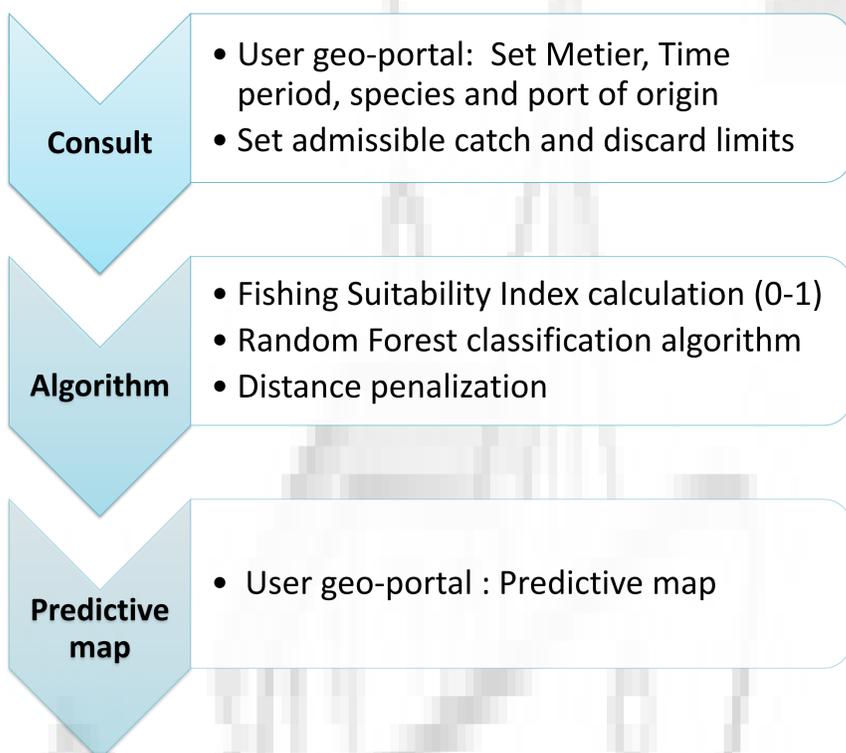
- Maximizing yields while minimizing discards
- Reduce fuel consumption
- Deal with spatial heterogeneity of species distribution

Methods:

• Random Forest algorithm for classification was used to calculate predictive fishing suitability maps based in fishing data from recent fishing locations (catch and discard by species and haul), and environmental conditions.

• Aiming to reduce fuel consumption, a distance penalization to port was included to favor nearby suitable fishing locations.

• Observer data from the Spanish discard sampling program from 2004 to 2008 for several species caught in the Cantabrian Sea (ICES area VIIIc) were used to illustrate and assess the proposed approach.



Penalized fishing suitability predictive map for hake using the Bermeo port as origin. Best fishing locations are shown in green.

Results:

Results varied among species and seasons, with better results achieved for balanced datasets, such as those for economically valuable target species with segregated life stages.

Conclusions:

- This on-line tool could be useful for Marine Spatial Planning (MSP), particularly in the context of the European Common Fisheries Policy reform and the discard ban on commercial species.
- The tool, developed in R language, can run in unsupervised and automatic mode, and it can be adapted to any fishery where discards occurs.