

Monitoring to assess climate change impacts on the structure and functioning of a sandy coastal marine fish assemblage

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Introduction

The beach-seine fishery is an ancient commercial fishing activity on the Portuguese coast – fishery carried out in Costa da Caparica (from 38°38'N, 9°13'W to 38°35'N, 9°08'W) and registered in the National Archive of Intangible Cultural Heritage, with reports dating as far back as the early 15th century (Franca and Costa 1979; Martins et al. 2000). The village of Costa da Caparica is located in Almada Municipality, characterized by having an extensive coastal area where 10 beach-seine vessels operate.

The dataset used in this study was composed of annual captures, for commercial beach-seine activities which were obtained from the monitorization of this fishery in the Costa de Caparica, between 2007 and 2018.

This work is a first step to evaluate the impacts of climate change in the structure and functioning of this coastal assemblage.

Methods

- Mean sea surface temperature and rainfall were calculated for the time-series and each year was classified as hot/cold or higher/lower rainfall;
- Dominant wind direction and intensity were estimated for each year;
- Species richness - number of different species represented in the ecological community was evaluated by year;
- Ecological guilds were assigned to each species (spawning-type, feeding, habitat, distribution range) (Beukhof et al. 2019) and the assemblage composition was compared. Corresponding percentage of the total catch was estimated for each guild and presented in stacked columns charts.

Conclusions

- 76 different species were captured in the time-series that included fishes (72), cephalopods(3) and crustaceans (1).
- Conclusions based on short time-series and seasonally spaced samplings may be precipitated, based on results that may come from an anomalous year.
- There is a strong interest to continue monitoring this fishery in order to collect data for long time-series to detect true catch composition.
- Continued monitoring can provide important indications on how climate change impacts this ecosystem.

