

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

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## Introduction

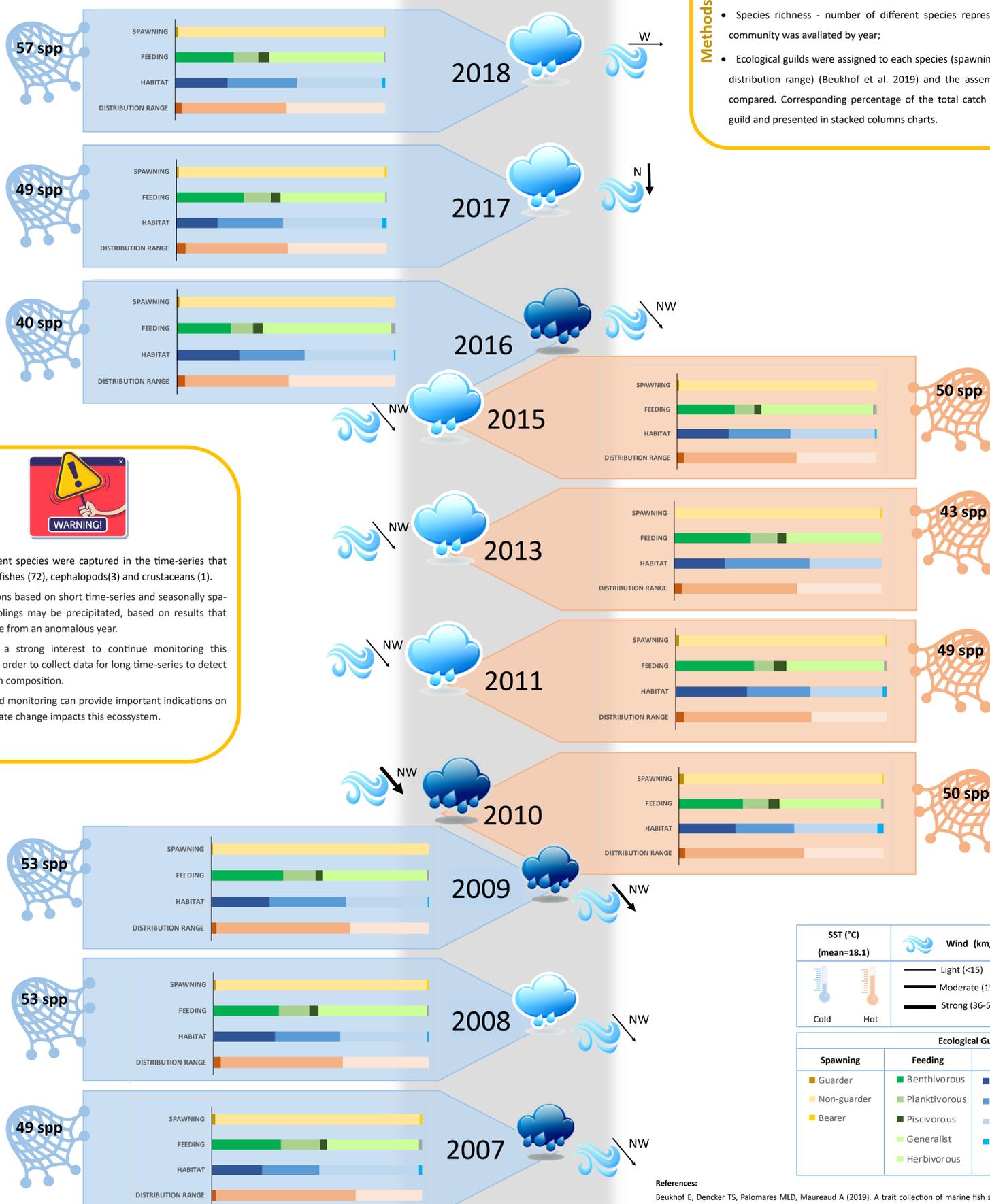
The beach-seine fishery is an ancient commercial fishing activity on the Portuguese coast – fishery carried out in Costa da Caparica (from 38°38'N, 9°13'W to 38°35'N, 9°08'W) and registered in the National Archive of Intangible Cultural Heritage, with reports dating as far back as the early 15<sup>th</sup> 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.



SST (°C) (mean=18.1)	Wind (km/h)	Rainfall (mean=18.4 mm)
Cold	Light (<15)	Higher rainfall
Hot	Moderate (15-35)	Lower rainfall
	Strong (36-55)	

Ecological Guilds			
Spawning	Feeding	Habitat	Distribution range
Guarder	Benthivorous	Benthopelagic	Tropical
Non-guarder	Planktivorous	Demersal	Subtropical
Bearer	Piscivorous	Pelagic	Temperate
	Generalist	Reef-associated	
	Herbivorous		

## References:

- Beukhof E, Dencker TS, Palomares MLD, Maureaud A (2019). A trait collection of marine fish species from North Atlantic and Northeast Pacific continental shelf seas. Available at: <https://doi.org/10.1594/PANGAEA.900866>
- Franca MLP, Costa FC (1979). Nota sobre as xávegas da Costa da Caparica e Fonte da Telha. Bol. Instituto Nacional de Investigação das Pescas, 1, 37-69. (in Portuguese)
- Martins R, Carneiro M, Rebordão F, Sobral M (2000). A pesca com arte de xávega. Relatórios Científicos e Técnicos do Instituto de Investigação das Pescas e do Mar, 48, 32pp. (in Portuguese)