

## **Environmental effects on *Octopus vulgaris* landings in northwest Spanish waters.**

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### **Summary (<200)**

The common octopus (*Octopus vulgaris*) is the target species of the cephalopod trap fishery in the NW Iberian Peninsula. Landings show wide inter and intra annuals fluctuations. We analyzed the logbook time series of the Spanish trap fishery from 2003 to 2012 to investigate its variability. There is a marked seasonality in the biomass index (catch per unit effort) with the highest value being reached place during the winter season, using generalized additive models (GAMs) we explore the potential effects of several environmental variables on time-series of octopus trap fishery. Results indicate significant effects of sea surface temperature (SST), NAO and the upwelling index on the octopus biomass index.

### **Introduction**

The common octopus (*Octopus vulgaris*) is a short-lived species, with a cycle of around 12–14 months and their growth is very rapid. Octopus is characterized by non-overlapping generations, with only one or two cohorts present in the fishery at any time. (Pierce and Guerra, 1994).

In the Spanish waters of the NW Iberian Peninsula the common octopus is mainly caught by artisanal and trawler fleets, where the artisanal trap fleet comprises more than 98% of octopus landings. (ICES, 2012).

This fishery shows manifest inter-annual and seasonal variability in catches, a phenomenon commonly exhibited by most fisheries involving short-lived species. Octopus recruitment is usually highly variable from year to year, and changes in abundance and recruitment between years may be explained as variations in environmental conditions that affect the early phases of cephalopod populations.

This work used octopus LPUE (landing by unit effort) as a proxy of index of abundance to identify relationship between abundance and environmental conditions

### **Materials and Methods**

The data used in this study are traps from the Spanish official logbooks for the period 2003–2012. These logbooks records provide information on landed weight of species by fishing day and ICES rectangle.

To estimate octopus abundance, LPUE was calculated as a division of the total landed in a month by boat (kg) and ICES statistical rectangle by the number of fishing days per month and ICES rectangle of the Spanish trap fishery that operate in this area. As explanatory variables we selected environmental variables as upwelling, SST, windstress, NAO, cloudiness by month and ICES rectangle.

To analyze the relationships between index of abundance (LPUE) and the environmental explanatory variables was used a Generalized Additive Model (GAM),

## Results and Discussion

Results from the GAMs for LPUE vs. the common trend in the environmental variables showed significant environmental effects for SST , upwelling and NAO on the abundance index.

Other studies which modelled *O. vulgaris* abundance in relation to environmental variables found that oceanographic conditions play a very significant role in determining the distribution and abundance during the planktonic stages of octopus and will set the year class strength (Moreno et al., 2009; Otero et al., 2009)

## References

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