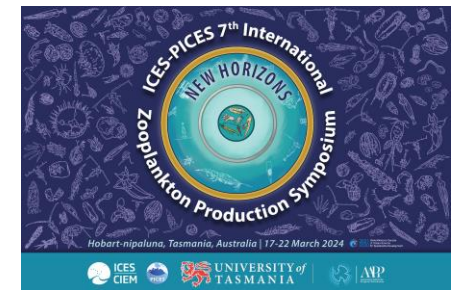# Zooplankton diversity and temporal dynamics in a coastal station in western Portugal (Northeastern Atlantic Ocean)

Antonina Dos Santos, Raquel Marques and Rita F. T. Pires

(10.7717/peerj.16387)

Introduction

➤ Coastal areas are complex systems under threat regarding the potential impact of climate change and anthropogenic pressures

➤ Zooplankton monitoring is key to detect long-term changes in marine communities' structure and climate change effects

➤ Upwelling areas are paramount sources of primary productivity, supporting substantial abundances of zooplankton and prosperous food webs, which is the case of the Portuguese coast in the northern limit of the Northeastern Atlantic Upwelling System
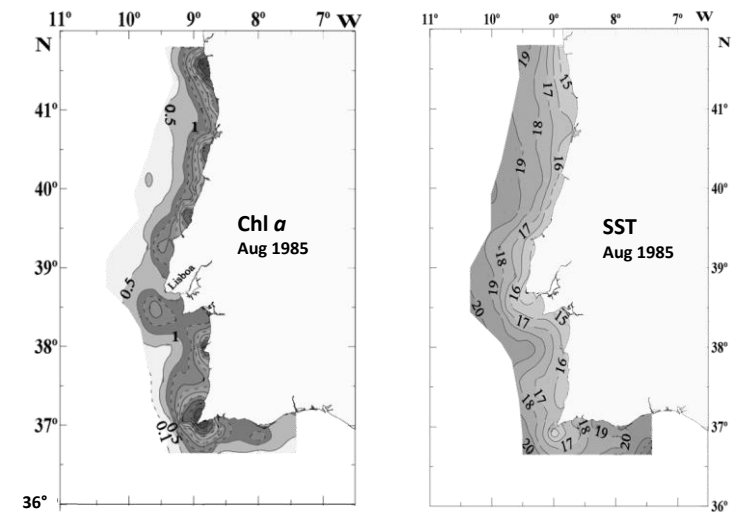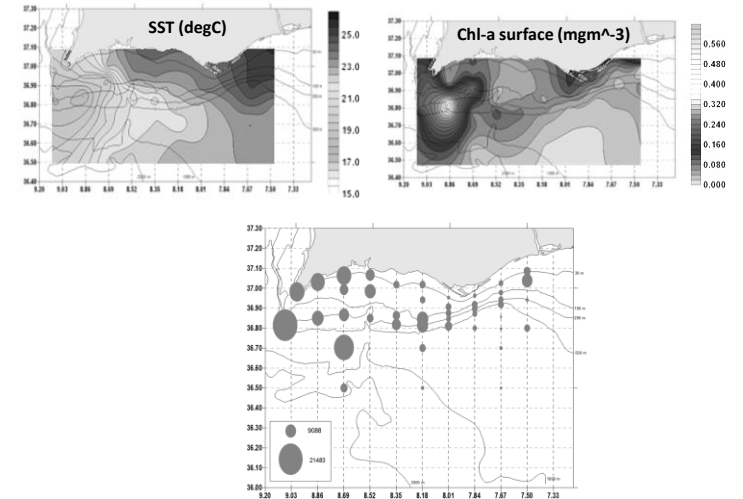

Images from Pires & Dos Santos (2020) at https://bit.ly/3IsGZSB

Introduction

➢ Climate predictions for Portugal suggest an intensification of the upwelling events, and decrease in precipitation and river runoff (e. g. Tagus)

➢ CascaisWatch is under the influence of seasonal upwelling, the Tagus estuarine plume and is placed in a retention area, driven by the sheltering effect of the nearby Capes

➢ Aim: Describe the dynamics and composition of the zooplankton community from 2005 to 2015. Our hypotheses are:

(i) we will notice a difference between spring/summer and winter periods in terms of zooplankton abundance and composition;

(ii) we expect high productivity during upwelling;

(iii) we expect to detect signs of shifts on the taxa composition and abundance through the years
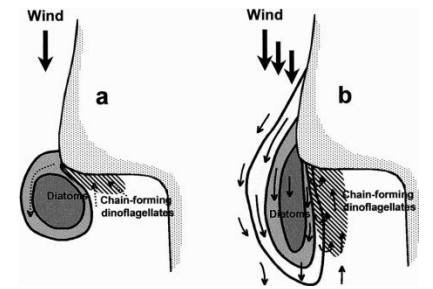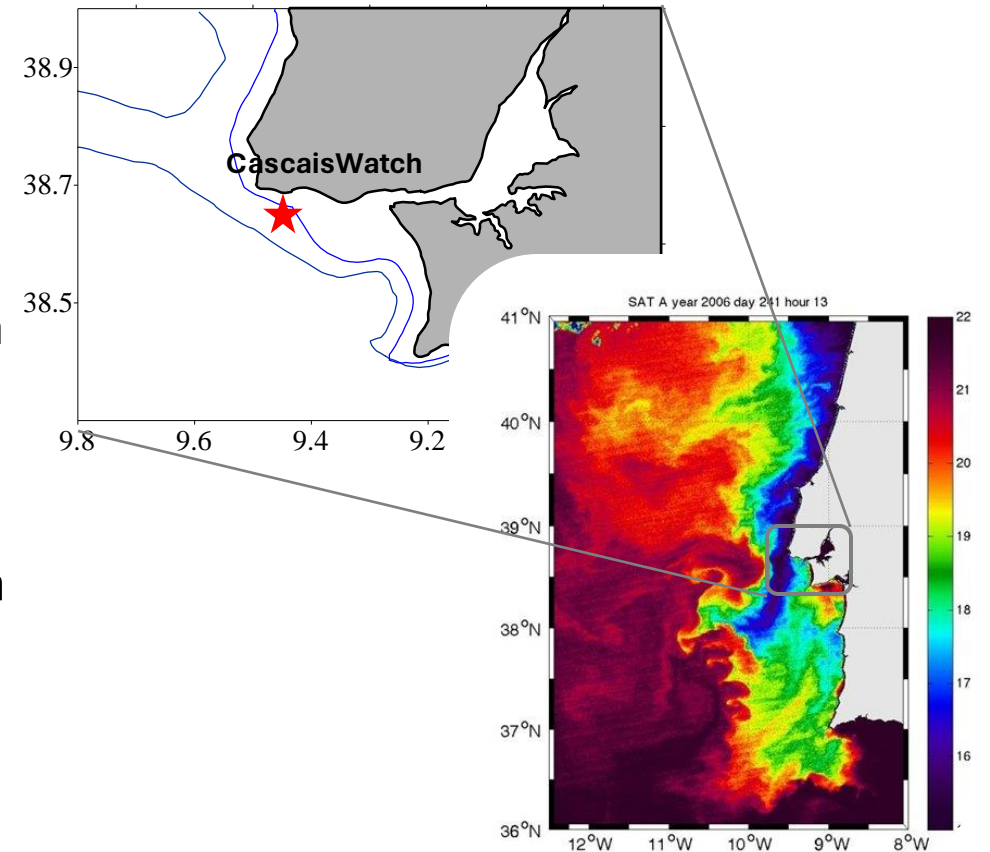
Representation of the upwelling shadow in Cascais Watch station area. (a) An early stage of upwelling and (b) a fully developed upwelling. Moita et al. 2003.

SCAN ME

Material & Methods

Sampling:
- Monthly sampling, from 2005 until 2015
- Oblique tows with WP2 net (0.26 m^2 mouth, 200 µm mesh)
- From bottom to surface at a rate of $10\text{-}20 \text{ m min}^{-1}$
- 2 hours before the high tide
- Samples preserved with 4 % borax buffered formaldehyde
- Temperature, salinity and fluorescence registered by CTD

Biomass:
- Displacement volume determination
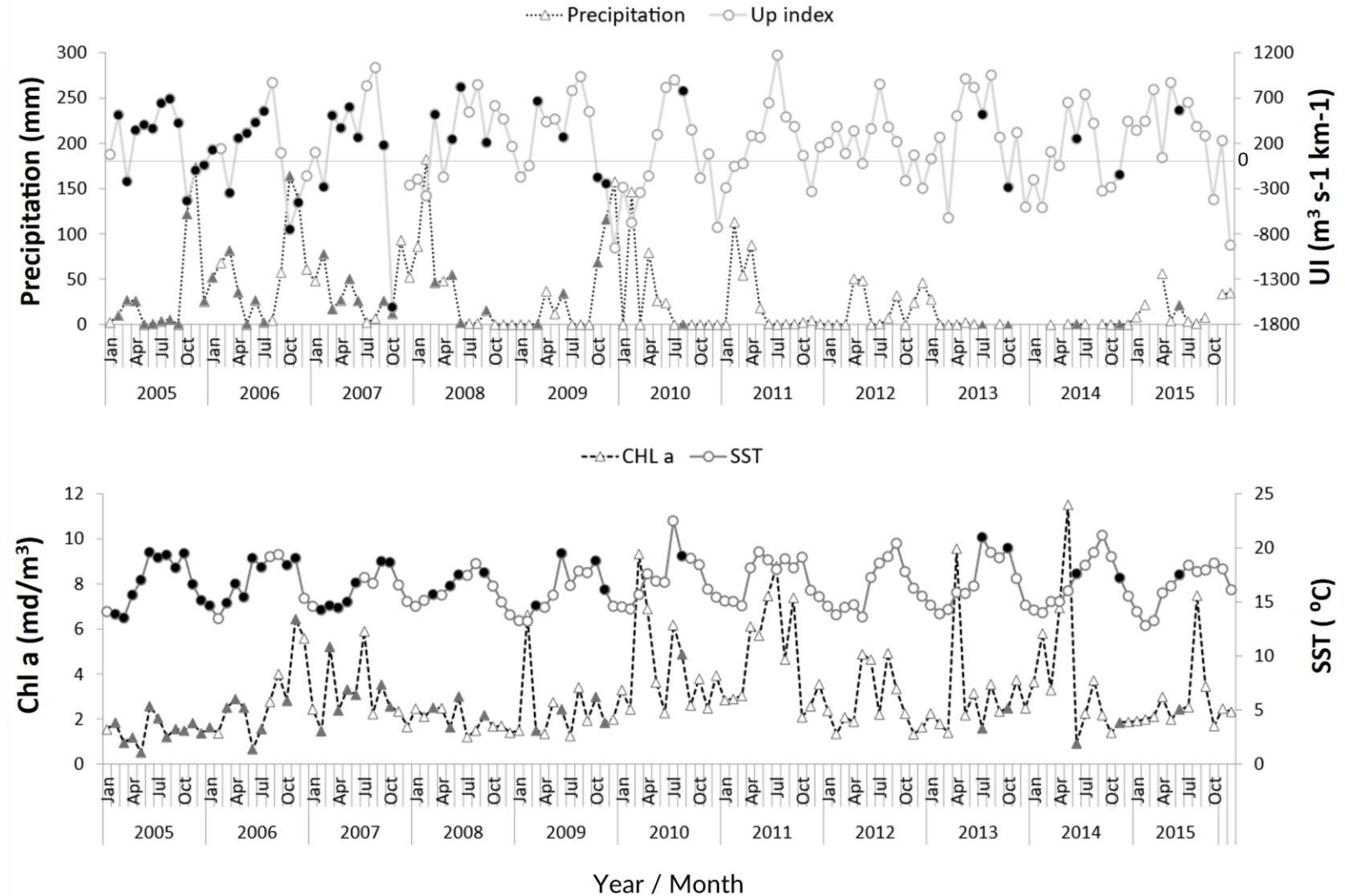- Converted to dry weight (Wiebe, 1988)

Abundance:
- Samples observed under stereomicroscope
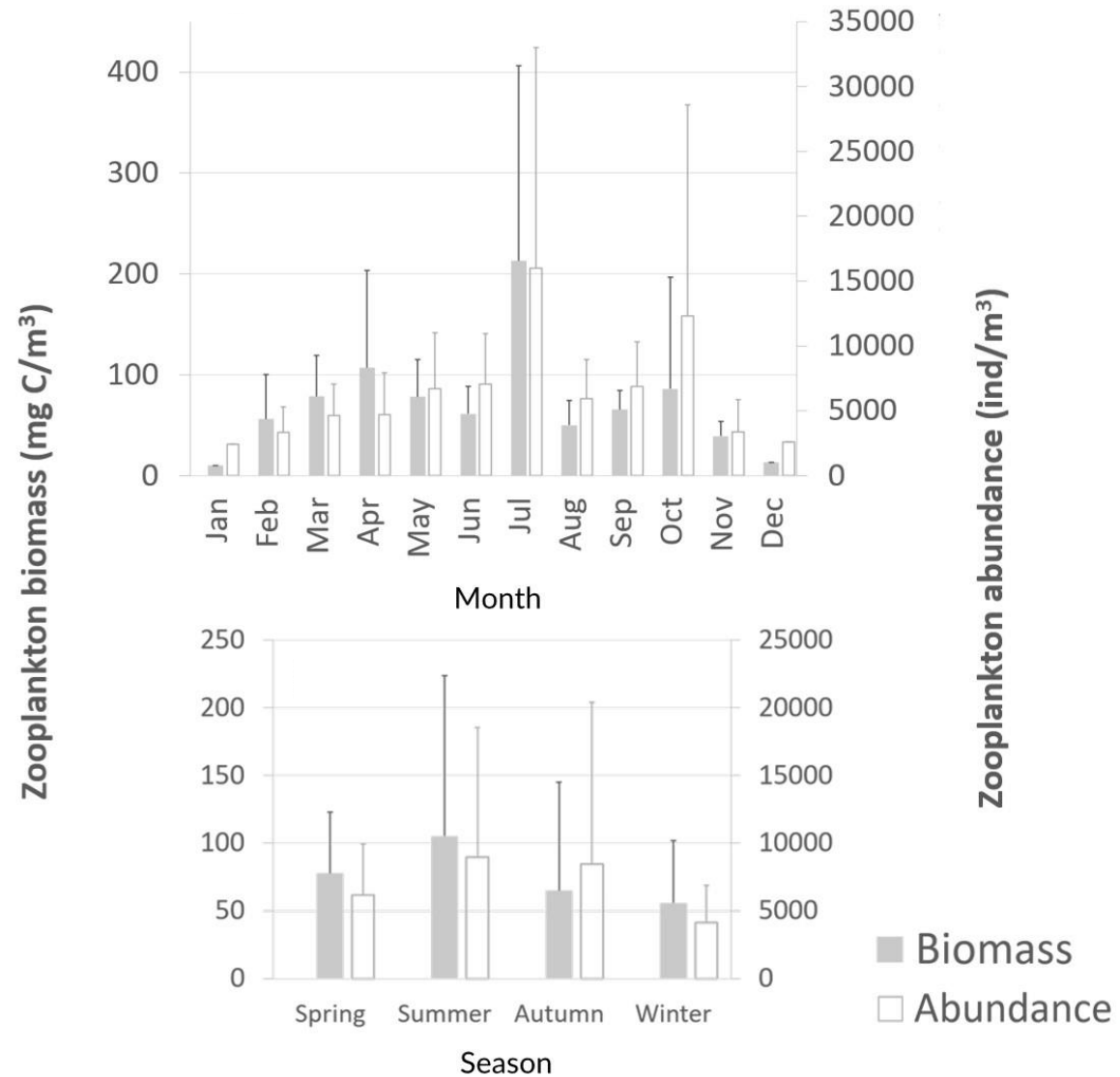- Organisms counted and identified until the lowest possible taxonomic level
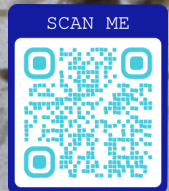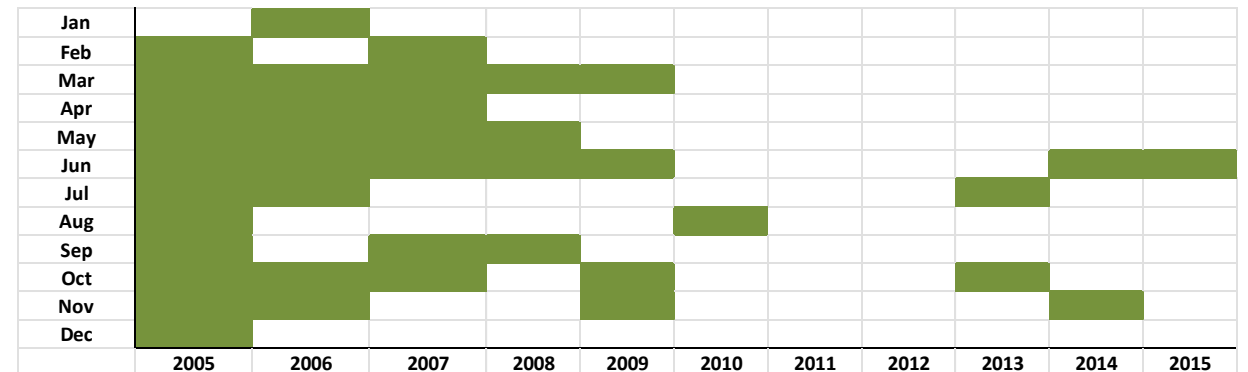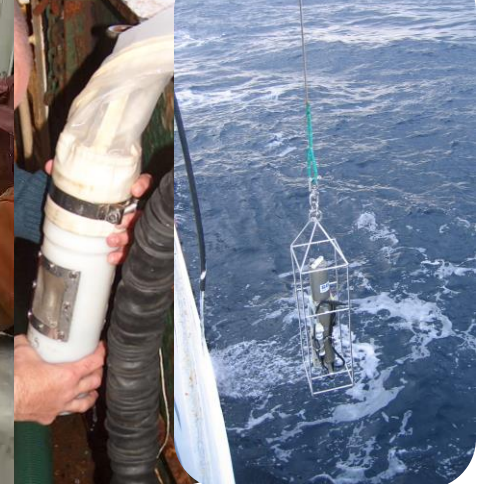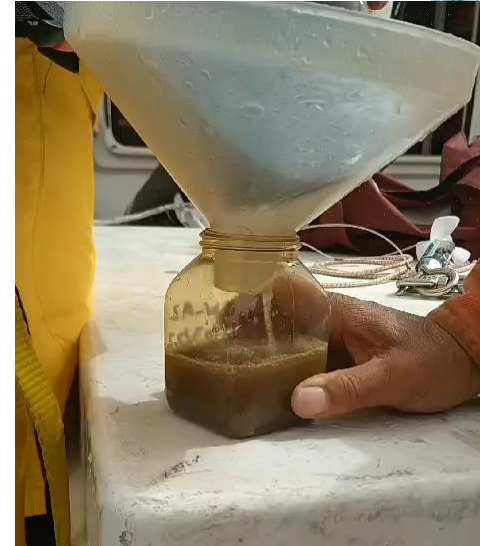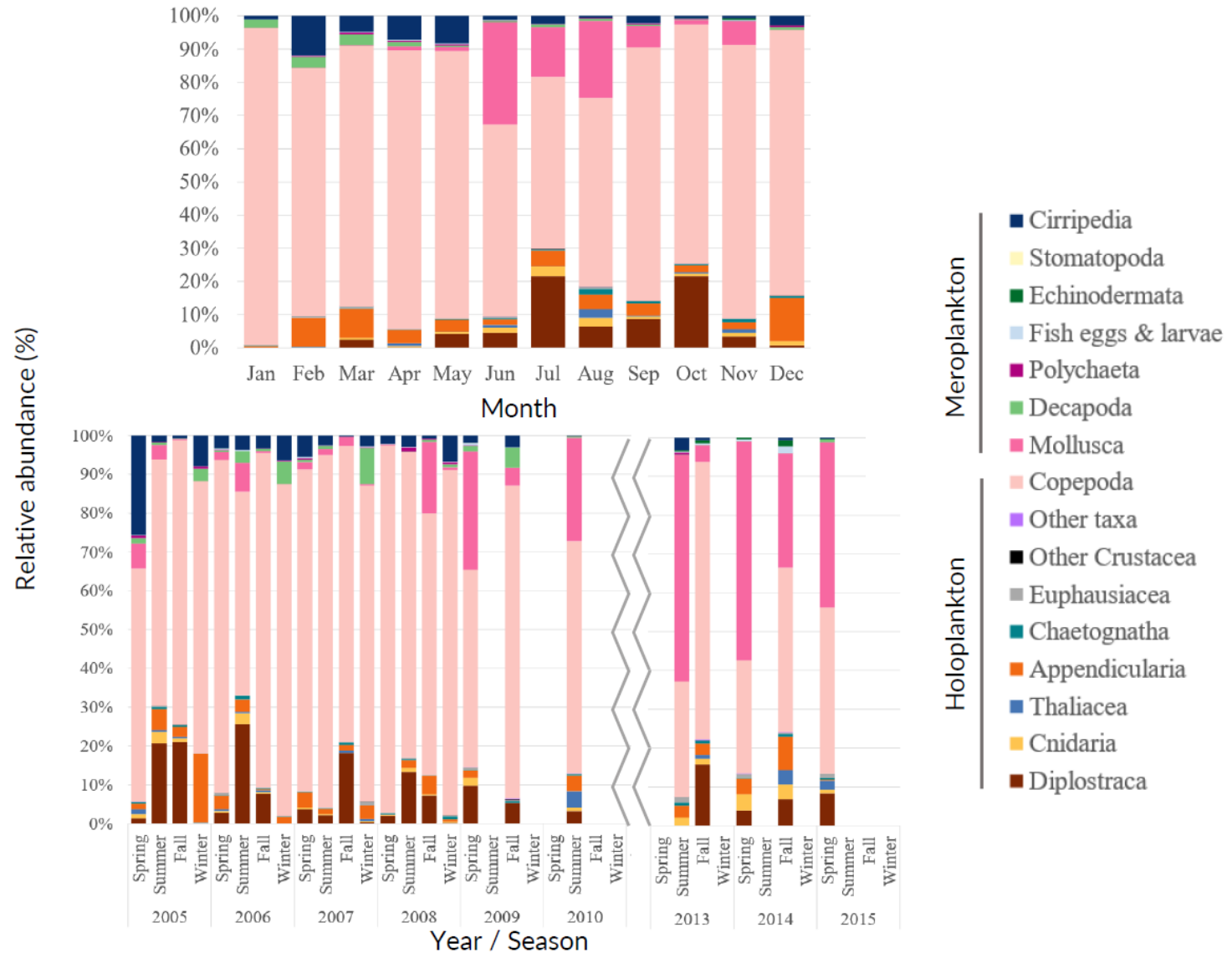
Results

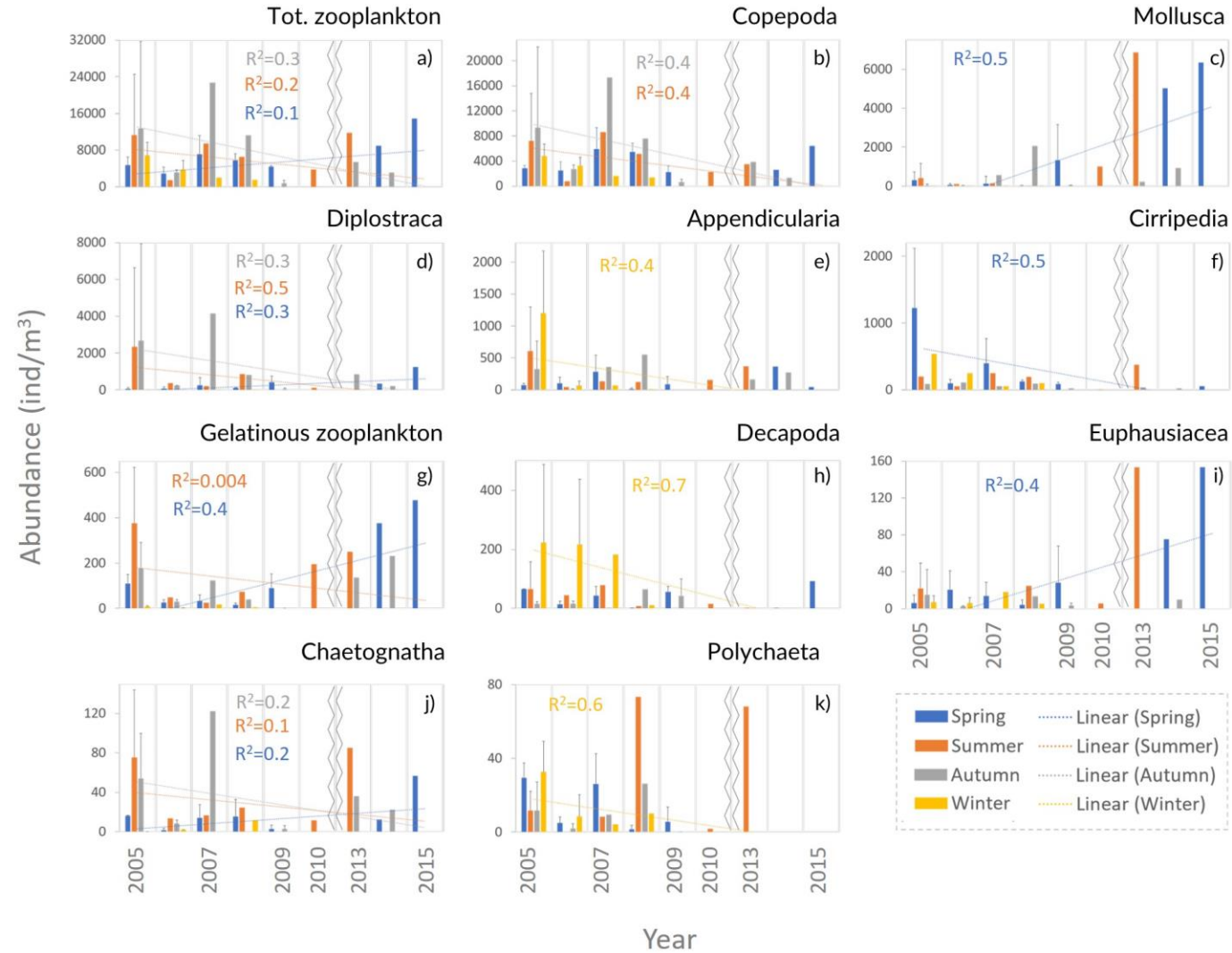- **Hydrographic conditions**

Results

- **Zooplankton biomass and abundance**

Results

- **Zooplankton relative abundance**

Results
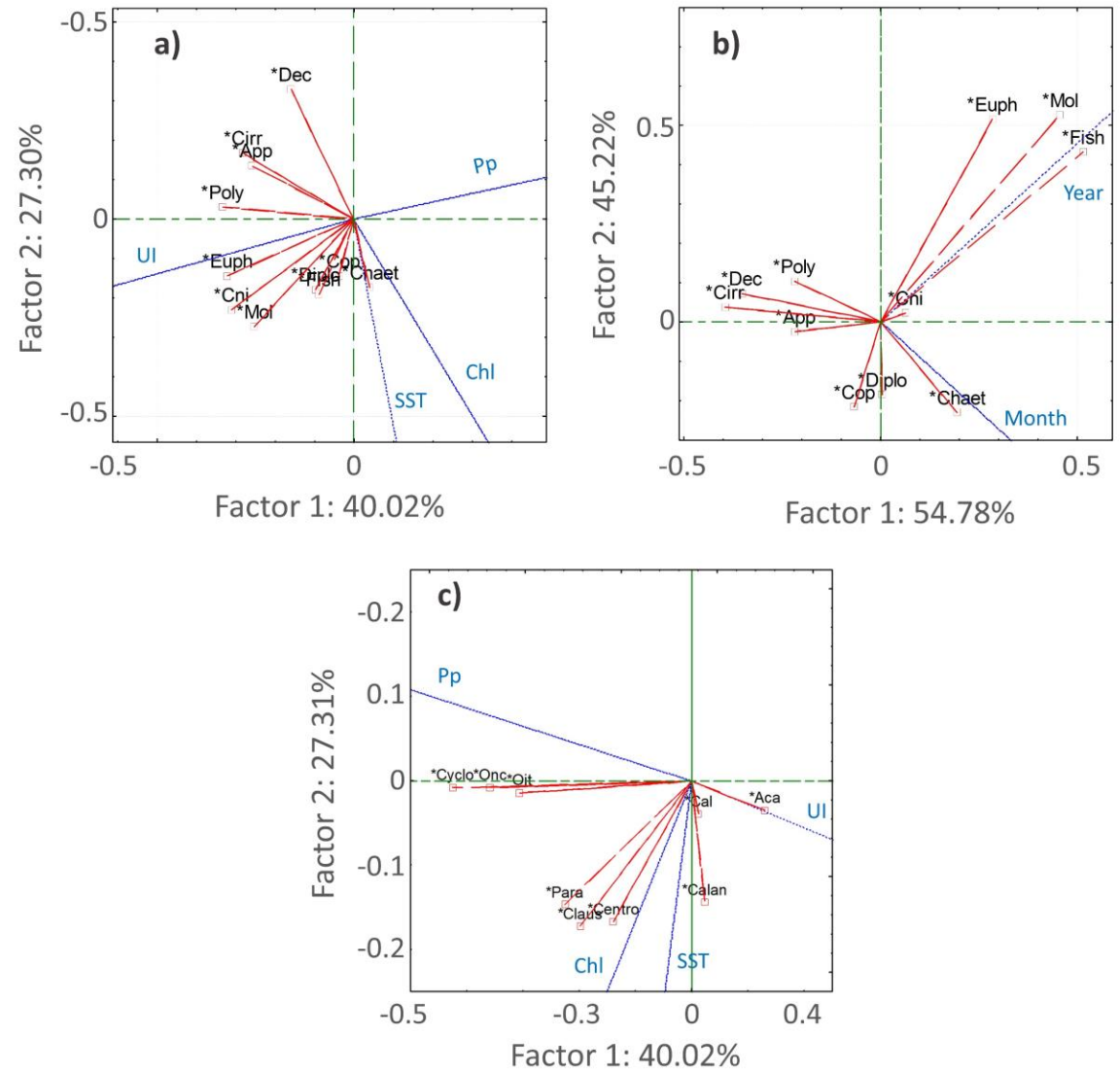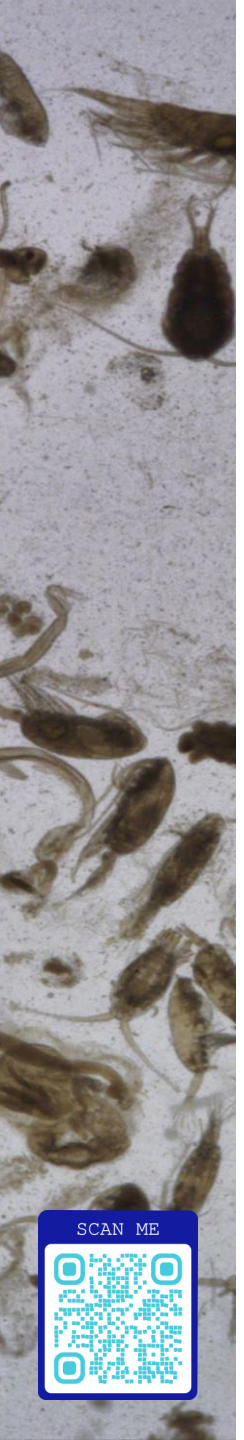
Results

- **Copepoda interannual abundance**
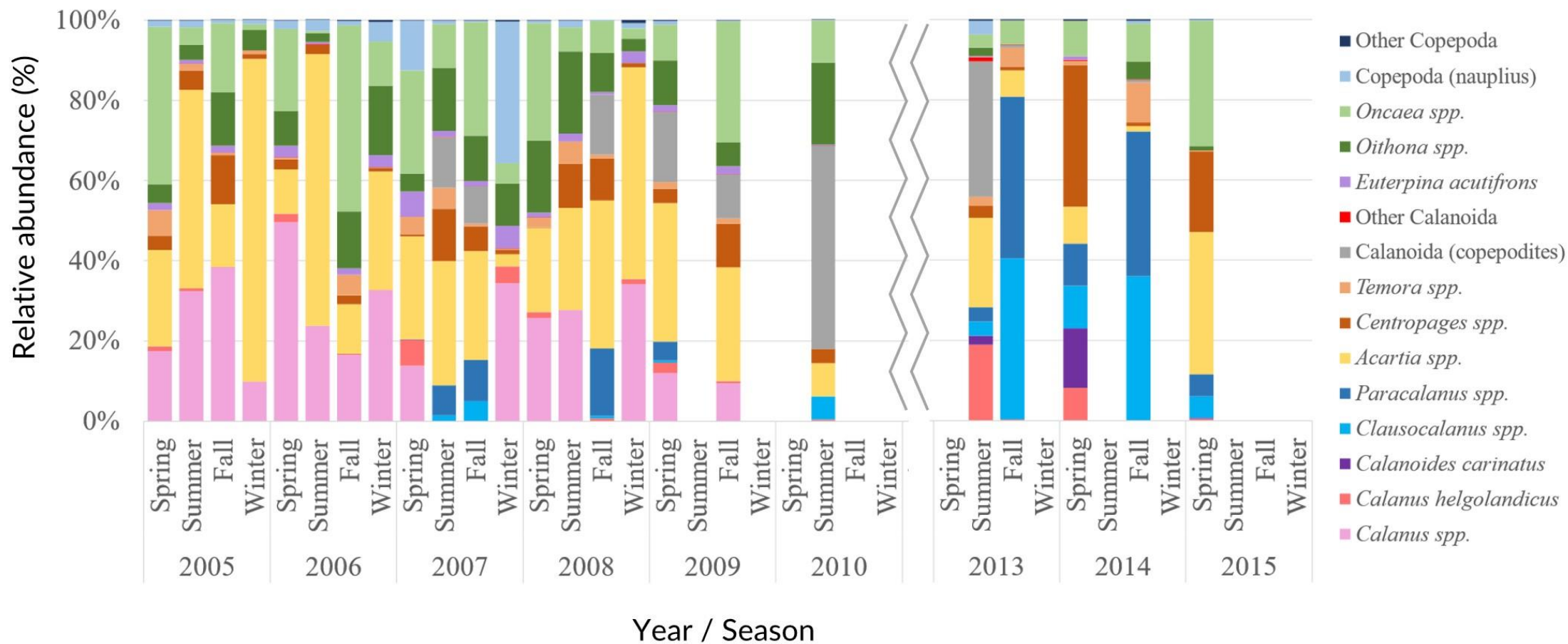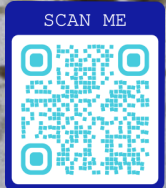
Results

- **PCA analysis**

Conclusions

we will notice a difference between spring/summer and winter periods in terms of zooplankton abundance and composition and expect high productivity during upwelling

➢High zooplankton productivity along the year, except during the winter months
➢Copepoda dominated the zooplankton community
➢Increasing interannual zooplankton abundance in spring

we expect to detect signs of shifts on the taxa composition and abundance through the years

➢Two main transition periods with marked changes in species dominance for the most abundant taxa
➢Increasing importance of the gelatinous species (particularly Cnidaria) for spring/summer months in recent years
➢Higher abundance of Bivalvia and fish larvae/eggs
➢Decreasing trend in the abundance of Decapoda and Cirripedia larvae

Thank you! Any questions?