

# Data Report LTER-MC

## Zooplankton

February 4, 2014

### Abstract

This report contains summary statistics and a preliminary visualizations of zooplankton data concerning the Gulf of Naples. Data refers to the years 1984-2012.

Please send any inquiries with regard to the data to Dr. Maria Grazia Mazzocchi (grazia@szn.it) and Dr. Iole di Capua (dicapua@szn.it).

## 1 Reading Notes

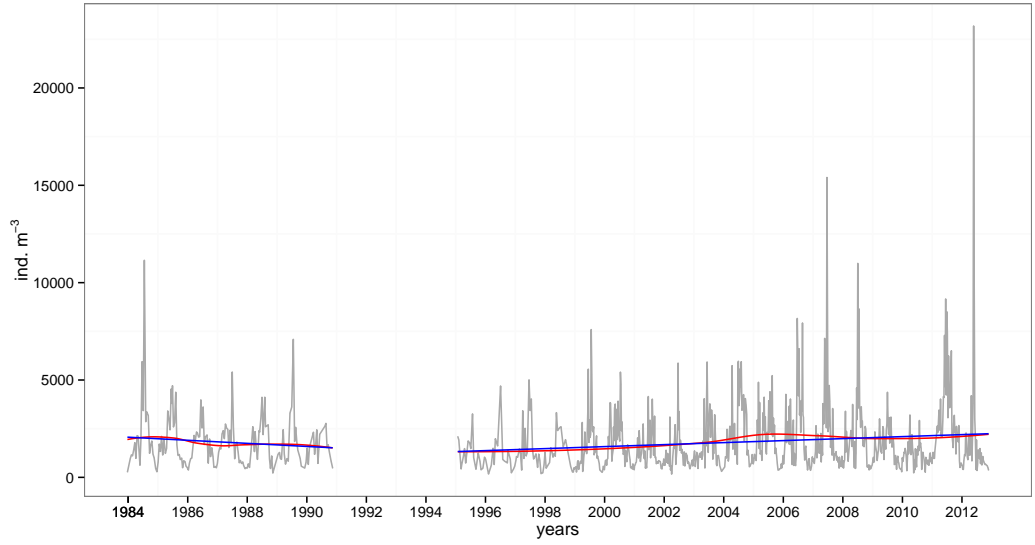
Data concerning the temporal distribution of zooplankton abundances are reported in Fig.(a). To extract the underlying structures of interest, filters based on local linear smoothing have been considered: the blue line is the regression line, the red line is the local polynomial regression curve. A test for linear deterministic trend (T-test) for the sub-periods 1984-1990 and 1995-2012 has been performed: values for the estimated coefficients and the *p values* are reported below the figure. The significance level  $\alpha$  has been set to 5 percent.

Boxplots allow to assess the distribution of data concerning groups abundances at annual Fig.(e), monthly Fig.(c) and weekly scale Fig.(b). Reported information concern the minimum, the lower quartile Q1 (bottom line of the box), the median (thick line at the middle of the box), the upper quartile Q3 (upper side of the box) and the maximum. The lines extending from the box are the whiskers. Data points beyond the whiskers are considered as possible outliers.

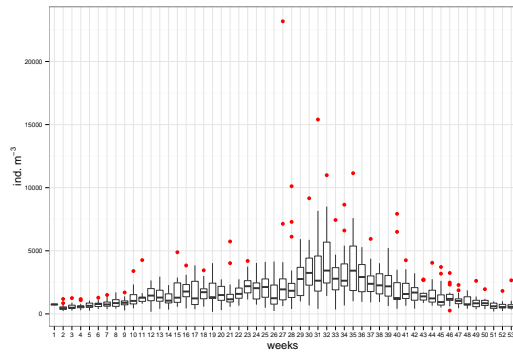
Heatmaps of zooplankton abundances is reported in Fig.(d). The  $x$  axis represents the weeks and the  $y$  axis reports the years. In the heatmaps values of abundances have been log-transformed.

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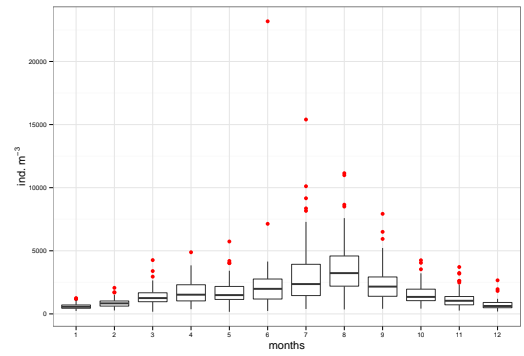
TOTAL ZOOPLANKTON



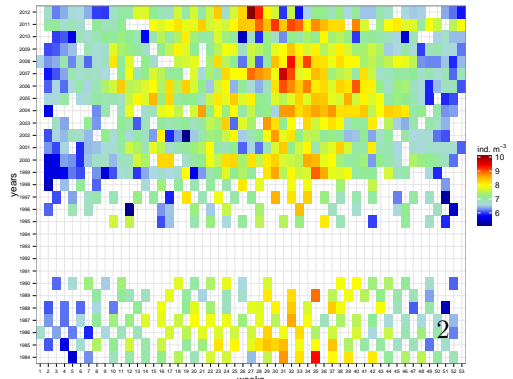
(a) Trend test 1984-1990 coef= -0.2166, pvalue= 0.1585; 1995-2012 coef= 0.1406, p-value= 0.0002



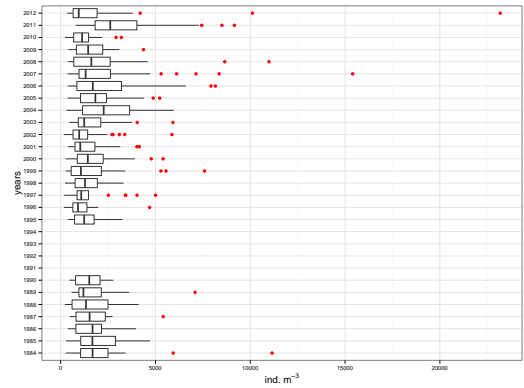
(b) Weekly distribution



(c) Monthly distribution



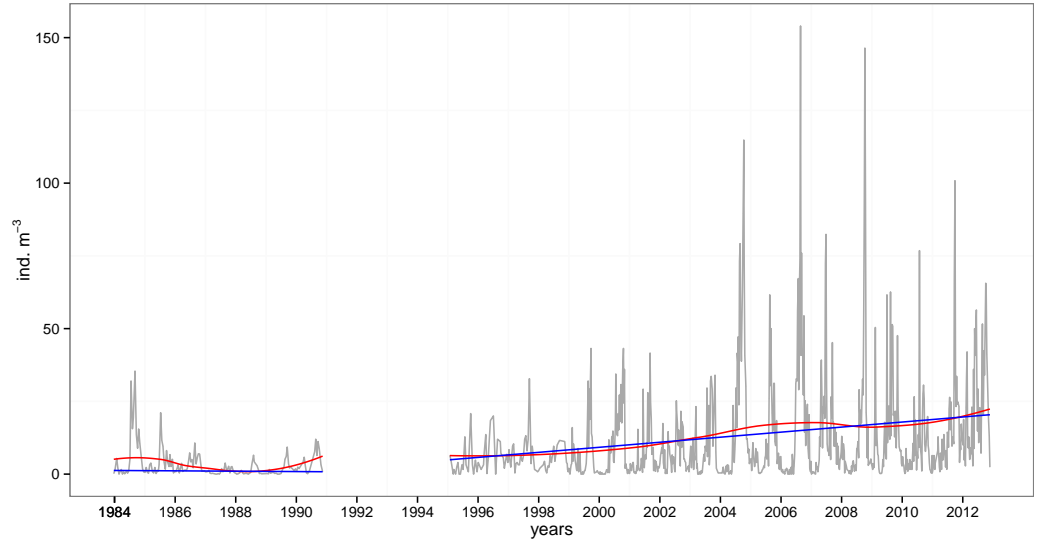
(d) Heatmap



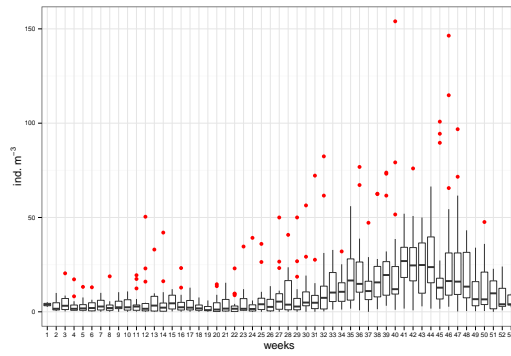
(e) Annual distribution

Figure 1: Total Zooplankton

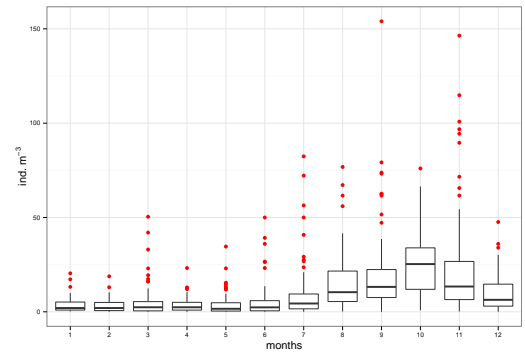
## CHAETOGNATHS



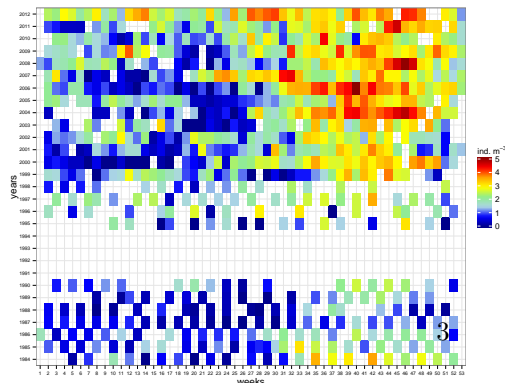
(a) Trend test 1984-1990 coef= -0.0014, pvalue= 0.0106; 1995-2012 coef= 0.0024, p-value= 0



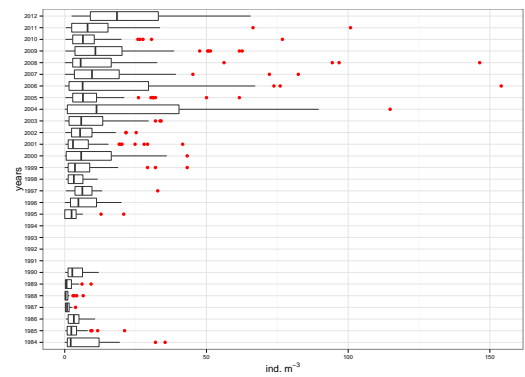
(b) Weekly distribution



(c) Monthly distribution



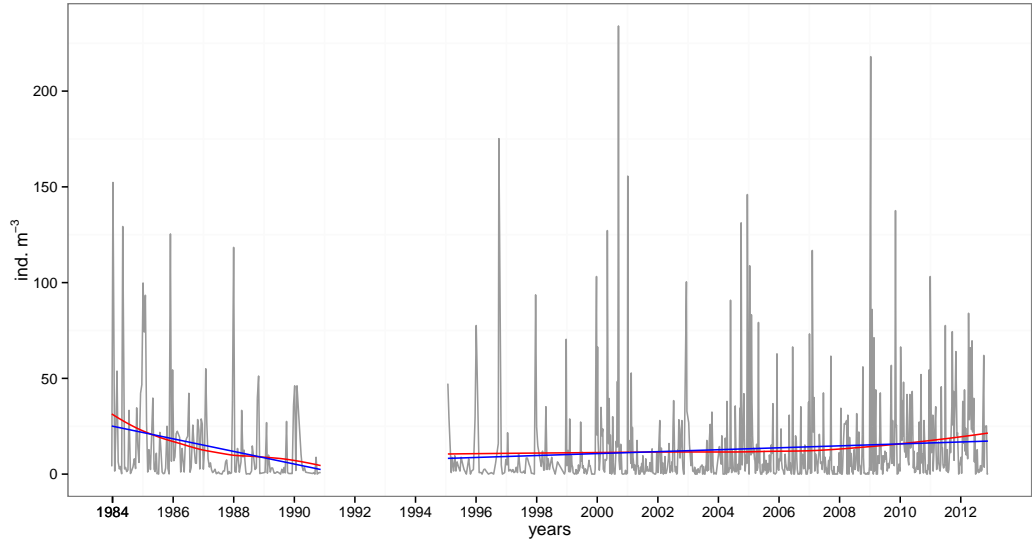
(d) Heatmap



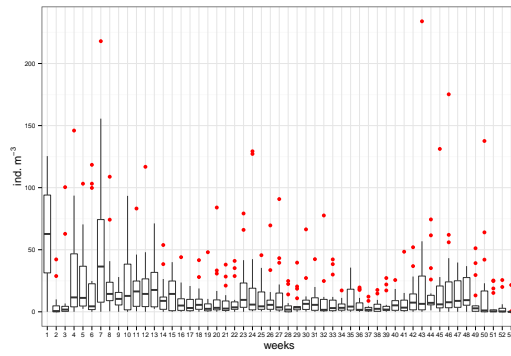
(e) Annual distribution

Figure 2: Chaetognaths

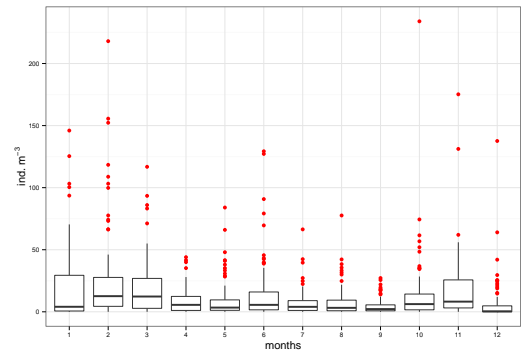
### CIRRIPEL LARVAE



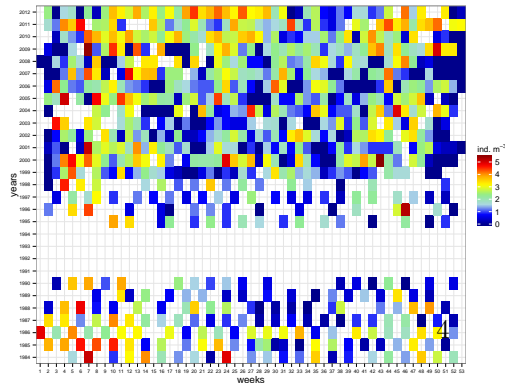
(a) Trend test 1984-1990 coef= -0.009, pvalue= 0.0014; 1995-2012 coef= 0.0014, p-value= 0.007



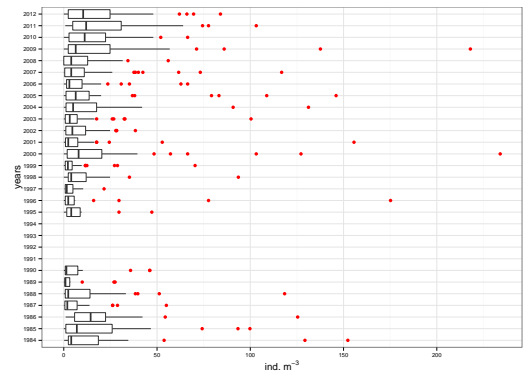
(b) Weekly distribution



(c) Monthly distribution



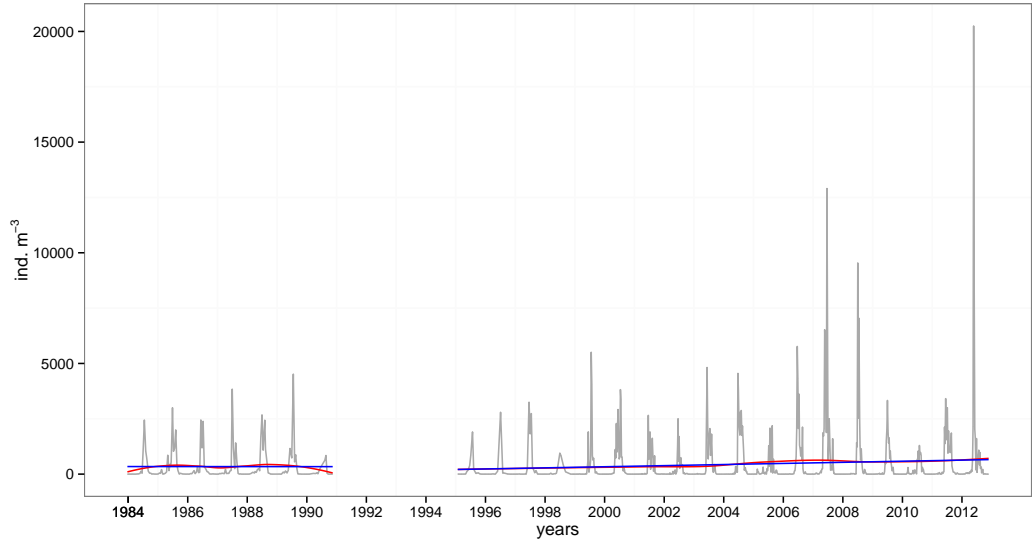
(d) Heatmap



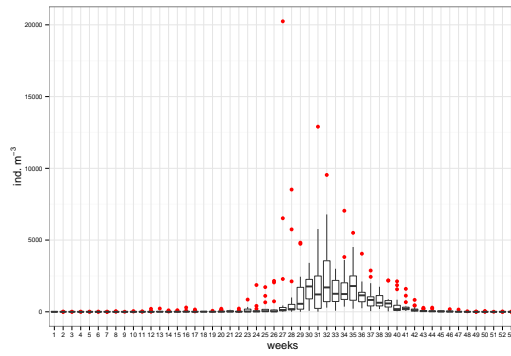
(e) Annual distribution

Figure 3: Cirriped Larvae

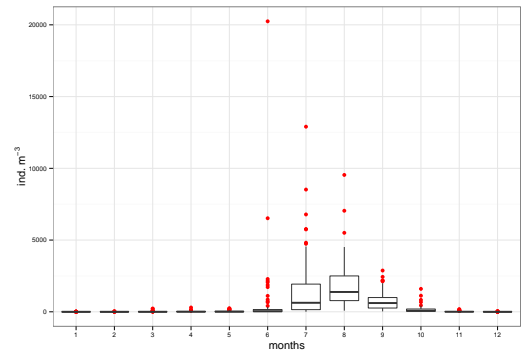
CLADOCERANS



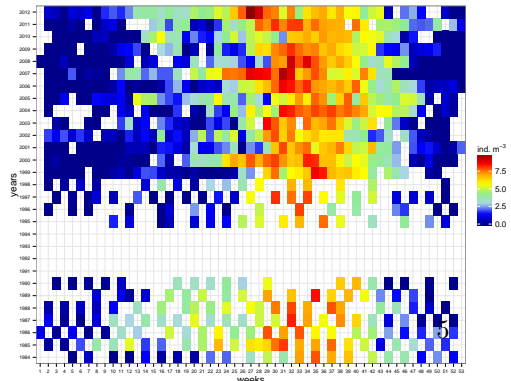
(a) Trend test 1984-1990 coef= -0.0015, pvalue= 0.985; 1995-2012 coef= 0.0683, p-value= 0.0166



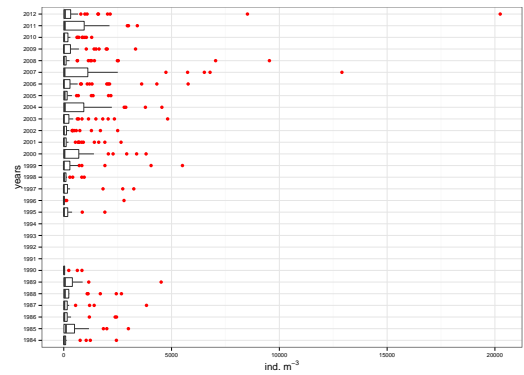
(b) Weekly distribution



(c) Monthly distribution



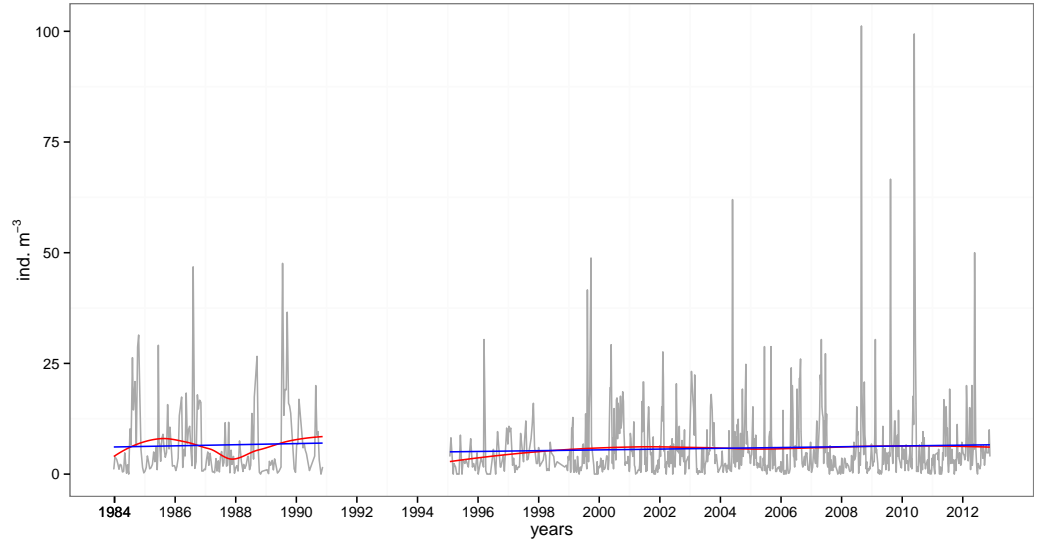
(d) Heatmap



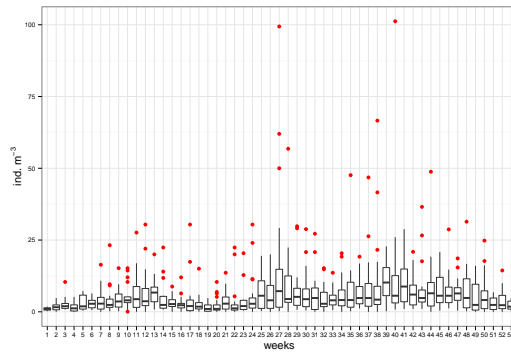
(e) Annual distribution

Figure 4: Cladocerans

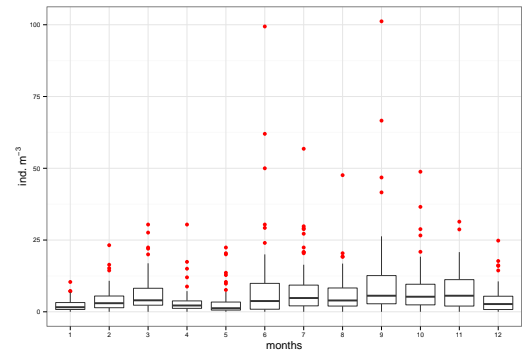
### CNIDARIANS



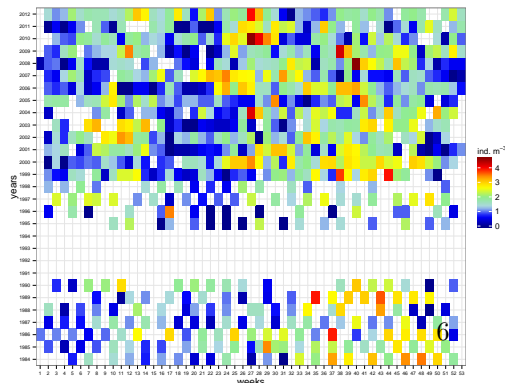
(a) Trend test 1984-1990 coef= 0.0003, pvalue= 0.7097; 1995-2012 coef= 0.0002, p-value= 0.1941



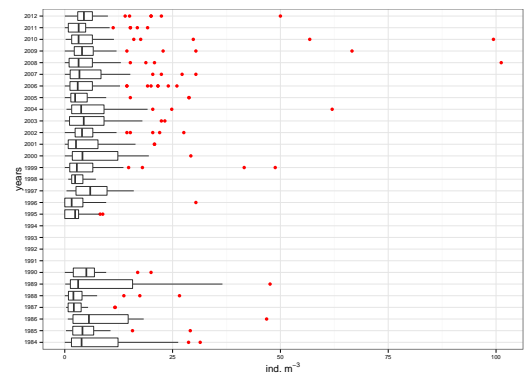
(b) Weekly distribution



(c) Monthly distribution



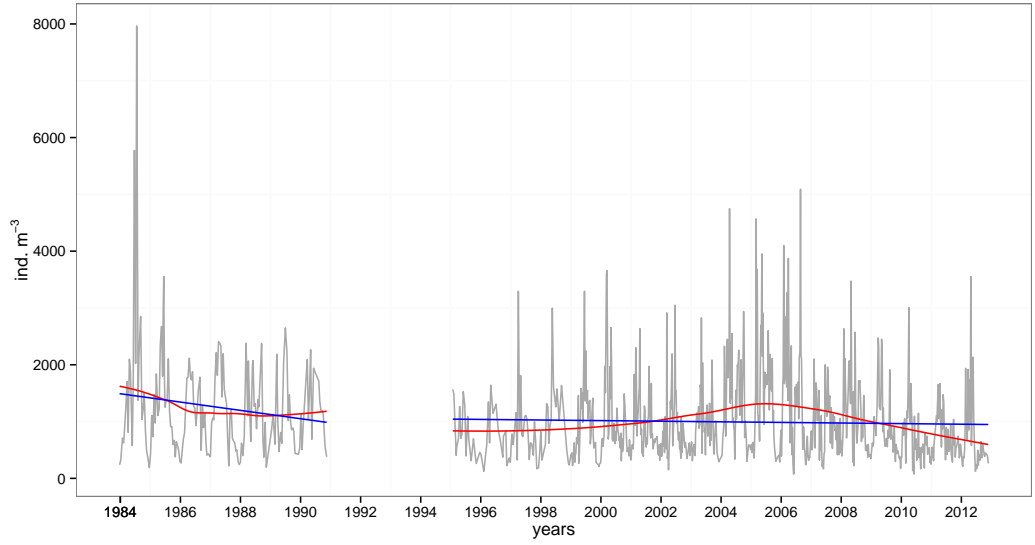
(d) Heatmap



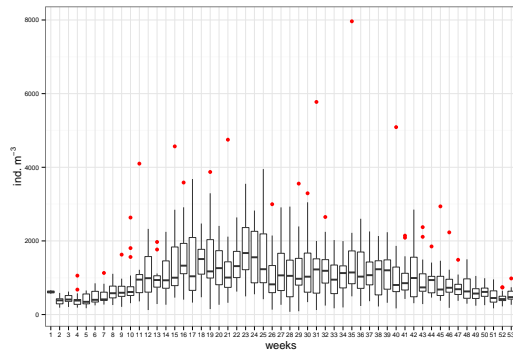
(e) Annual distribution

Figure 5: Cnidarians

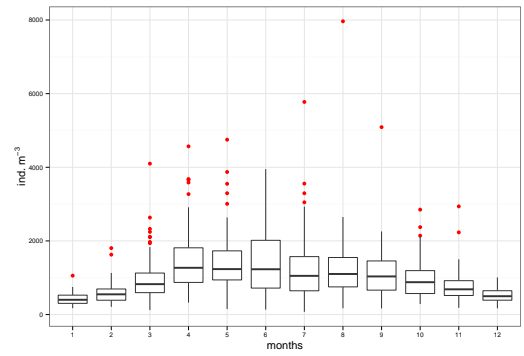
COPEPODS



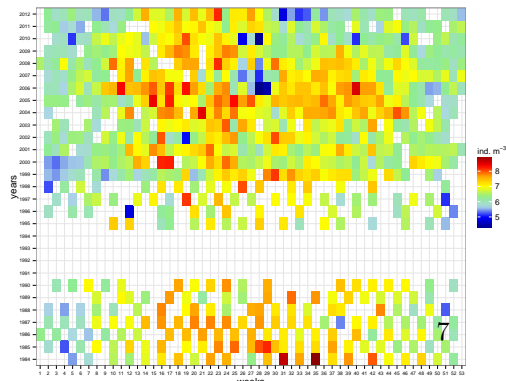
(a) Trend test 1984-1990 coef= -0.2005, pvalue= 0.0536; 1995-2012 coef= -0.0145, p-value= 0.3412



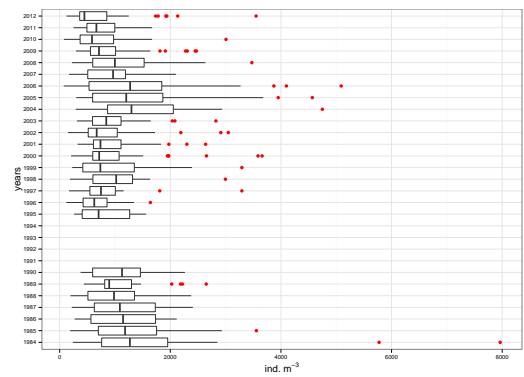
(b) Weekly distribution



(c) Monthly distribution



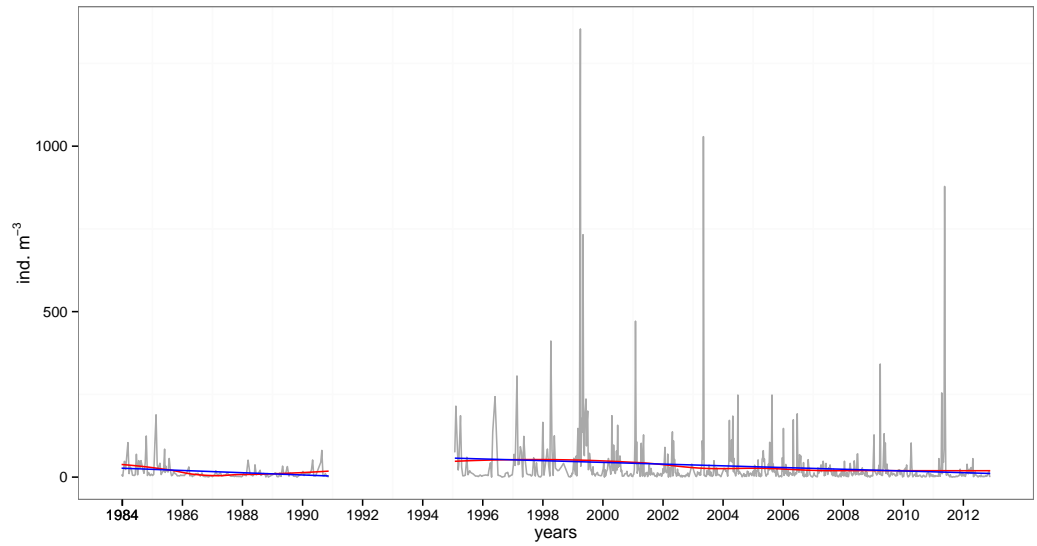
(d) Heatmap



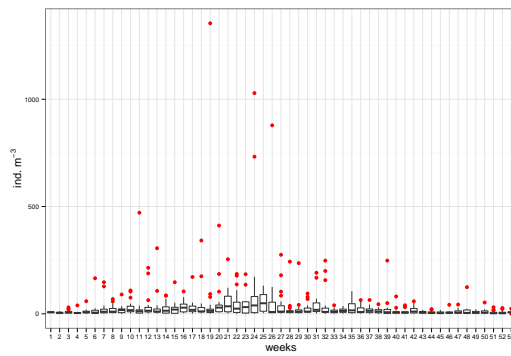
(e) Annual distribution

Figure 6: Copepods

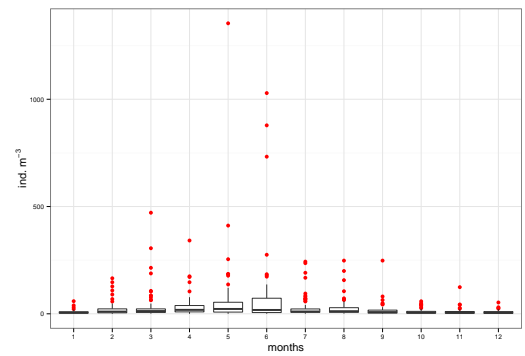
### MALACOSTRACA LARVAE



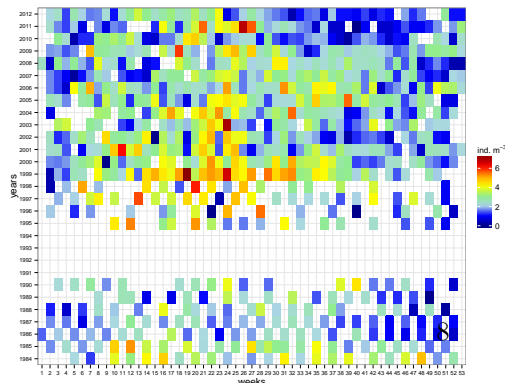
(a) Trend test 1984-1990 coef= -0.0093, pvalue= 0.0006; 1995-2012 coef= -0.0071, p-value= 0.0001



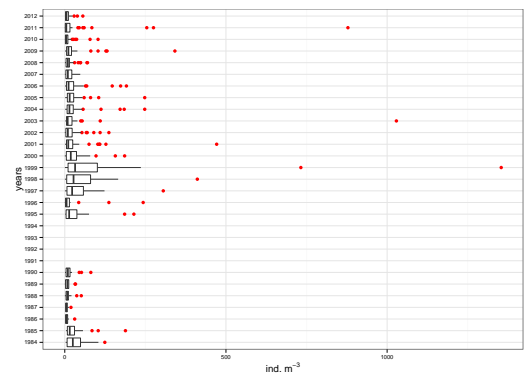
(b) Weekly distribution



(c) Monthly distribution



(d) Heatmap

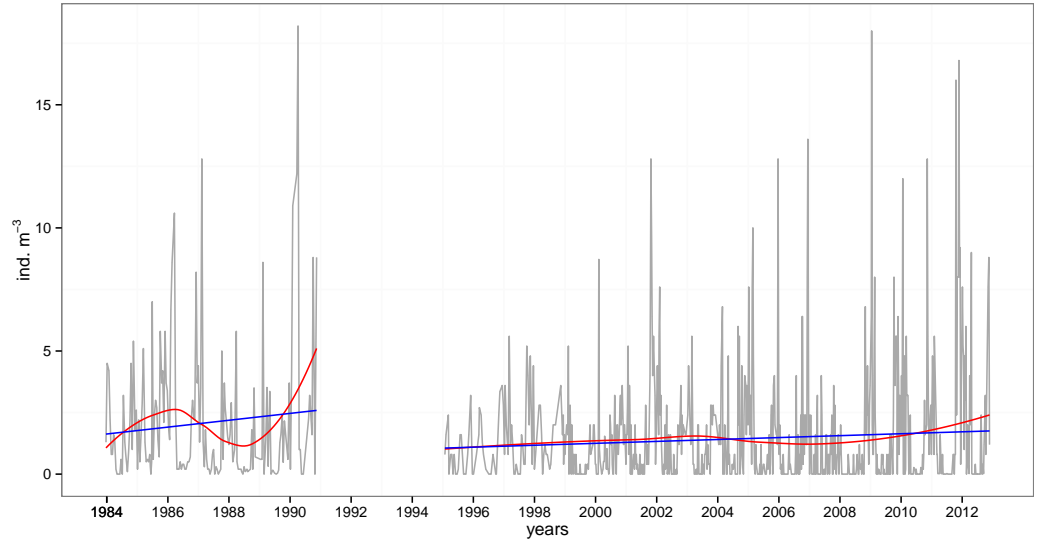


(e) Annual distribution

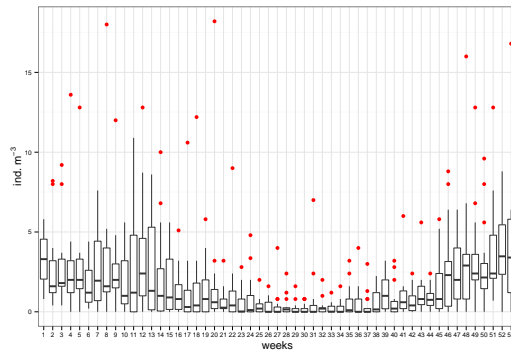
Figure 7: Malacostraca Larvae



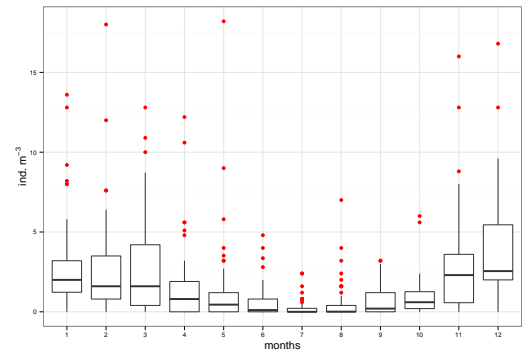
OSTRACODS



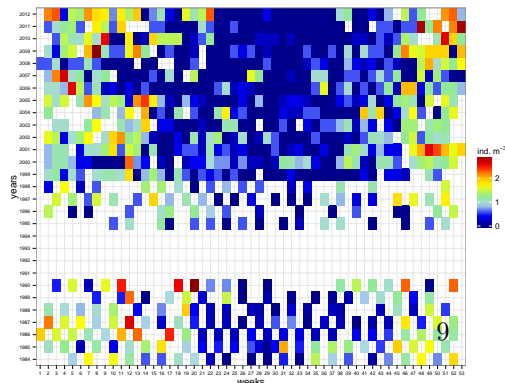
(a) Trend test 1984-1990 coef= 0.0004, pvalue= 0.2268; 1995-2012 coef= 0.0001, p-value= 0.0278



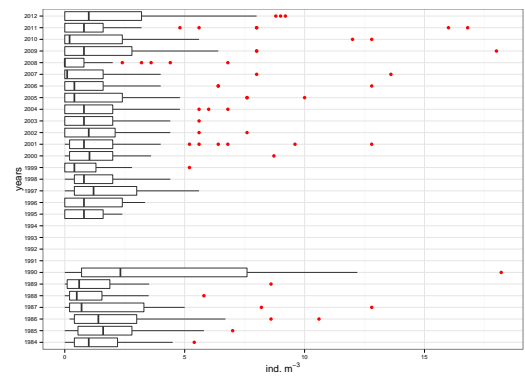
(b) Weekly distribution



(c) Monthly distribution



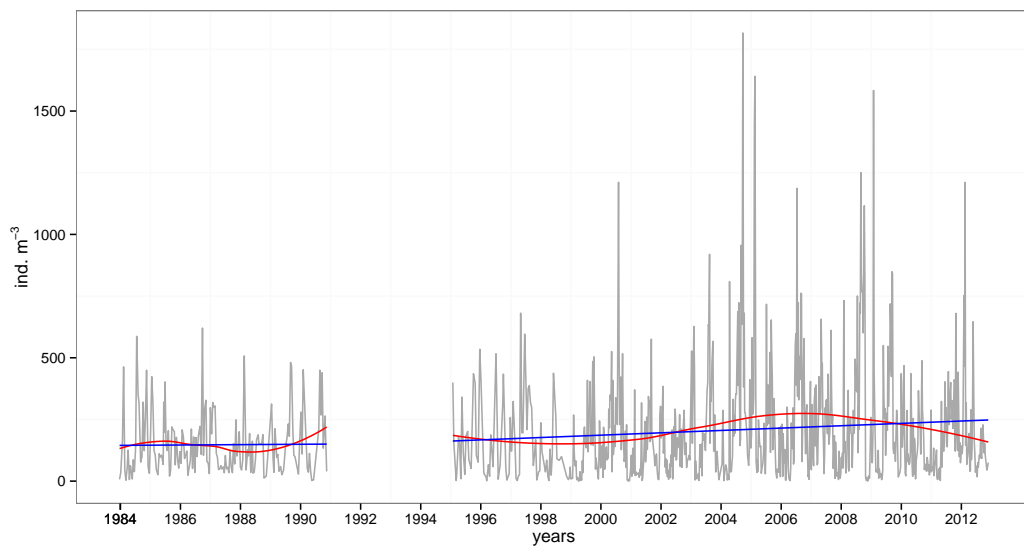
(d) Heatmap



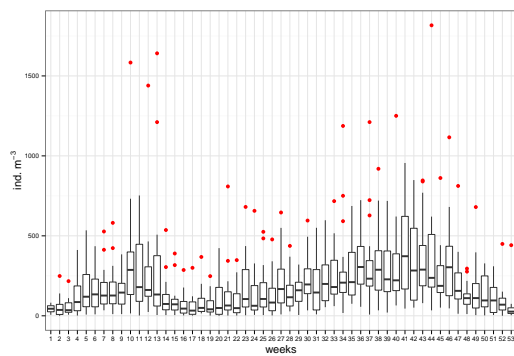
(e) Annual distribution

Figure 8: Ostracods

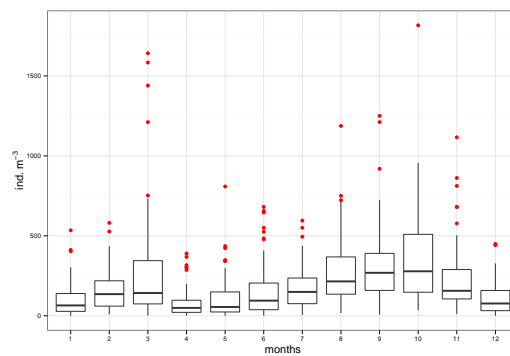
### TUNICATES



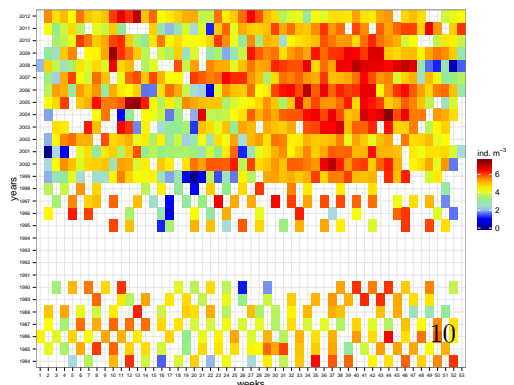
(a) Trend test 1984-1990 coef= 0.002, pvalue= 0.8863; 1995-2012 coef= 0.0131, p-value= 0.0071



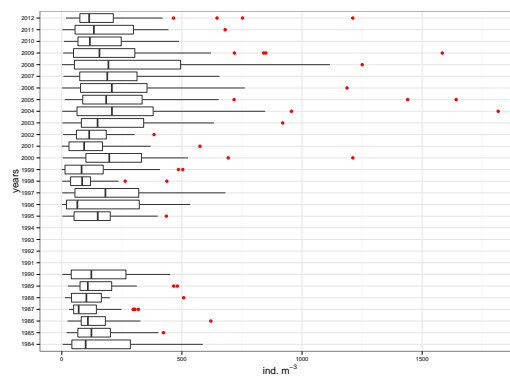
(b) Weekly distribution



(c) Monthly distribution



(d) Heatmap



(e) Annual distribution

Figure 9: Tunicates