

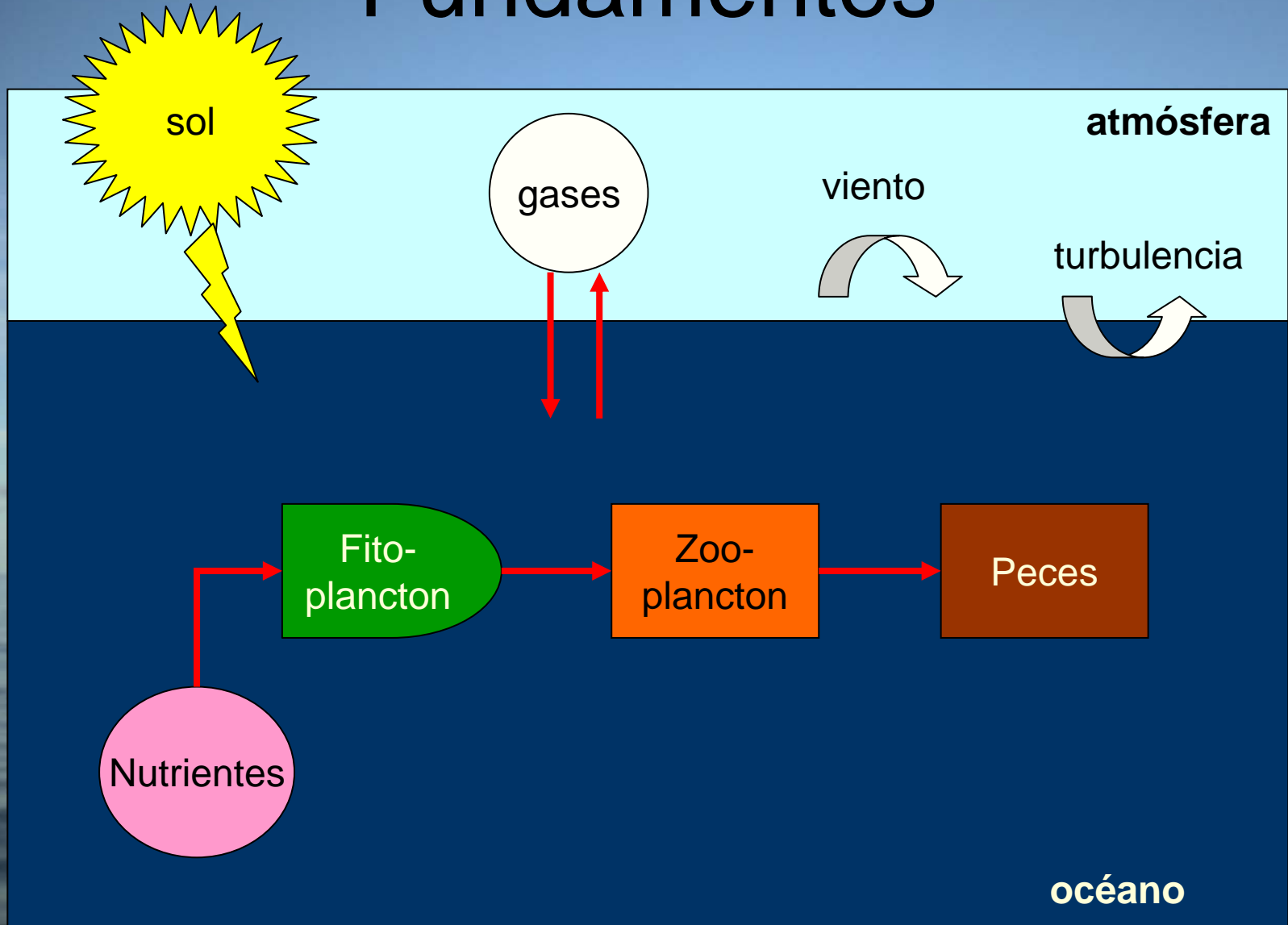
Evidencias del cambio climático en Galicia (CLIGAL)

# el ecosistema pelágico

A. Bode

Instituto Español de Oceanografía

# Fundamentos



# Objetivo

- Análisis de tendencias y variabilidad de baja frecuencia (años, décadas) en:
  - Productores primarios (**Fitoplancton**)
  - Consumidores primarios (**Zooplankton**)
  - Consumidores de plancton (**Sardina**)

# Series de Datos

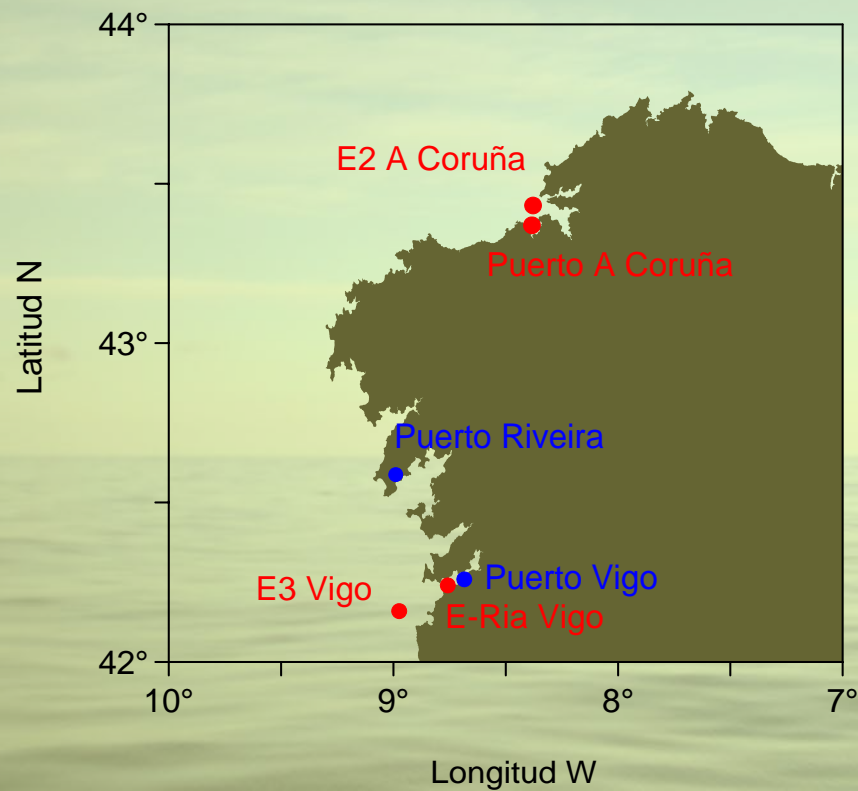
- Series diarias-semanales:

- A Coruña, 1996-2006 → Fitoplancton (IEO)
- Vigo, 1987-1995 → Fitoplancton (IIM)

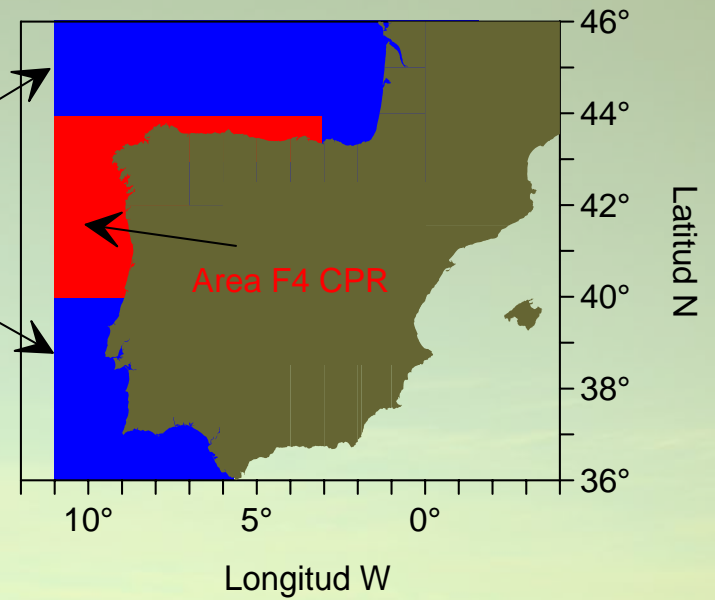
- Series mensuales:

- A Coruña, 1990-2006
  - Vigo, 1990-2006
  - Atlántico NE, 1958-2003
- { Fitoplancton (IEO)  
Zooplancton (IEO)
- { Fitoplancton (CPR)  
Zooplancton (CPR)
- Atlántico NE, 1948-2003 → sardina total (ICES)
  - Vigo, 1907-2006 → sardina total (IEO)
  - Vigo & Riveira, 1978-2006 → sardina juv. (IEO)

# Zona de estudio

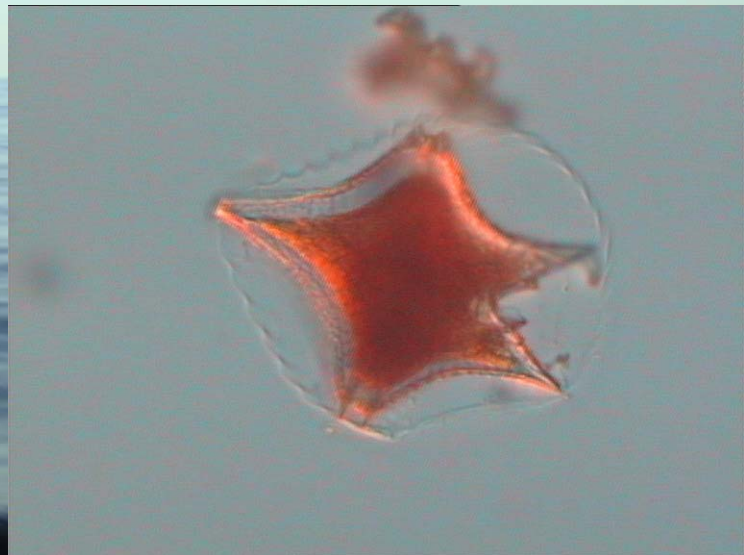
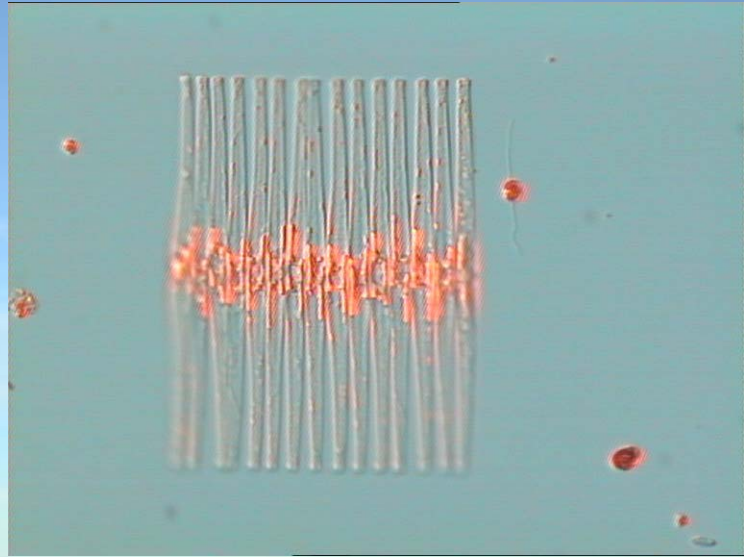


Areas VIII-IX ICES

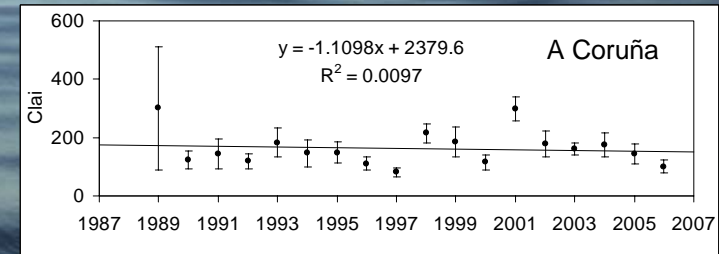
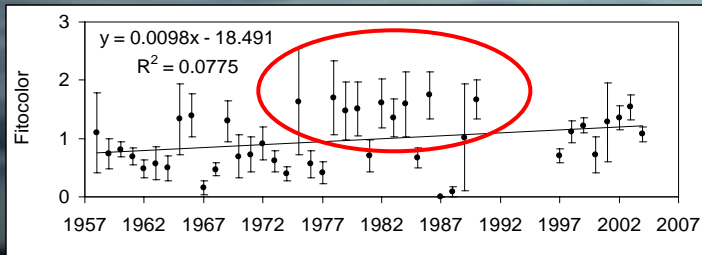
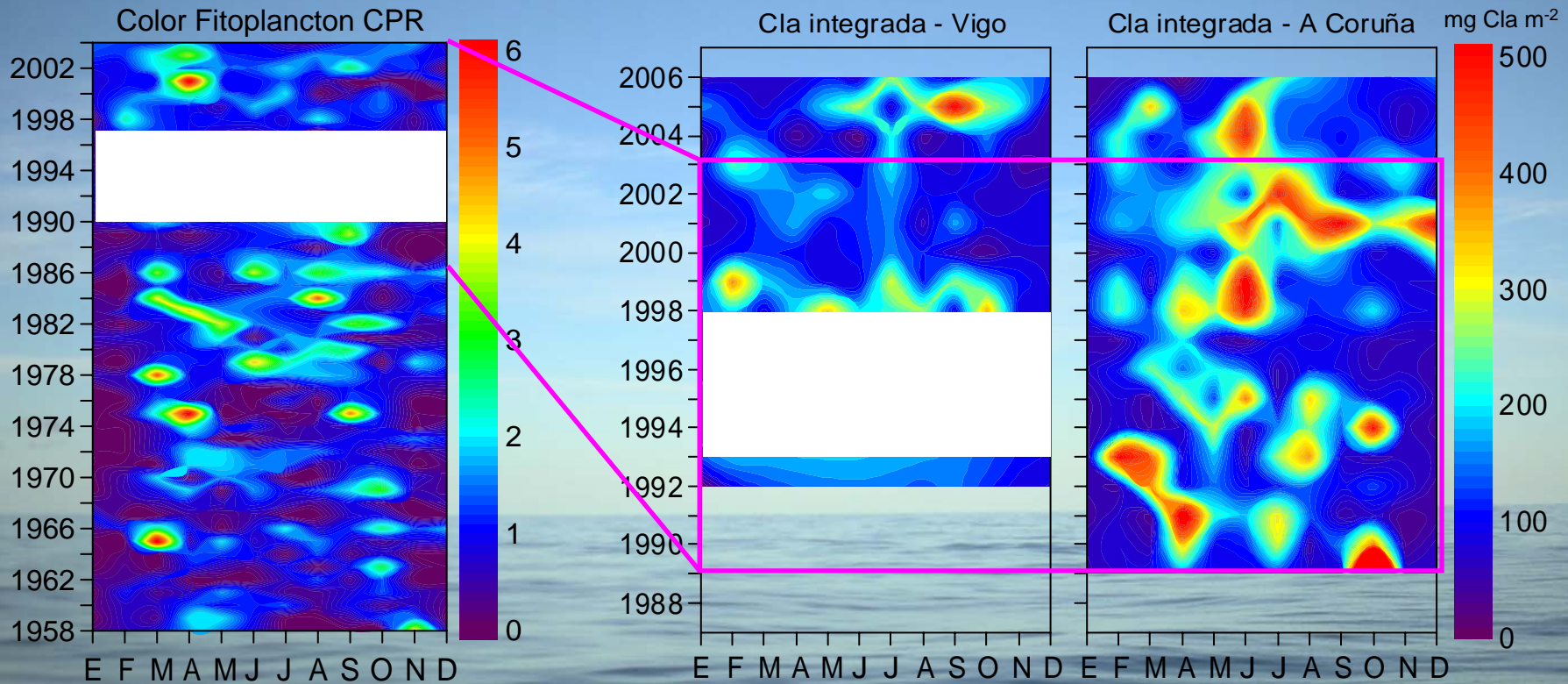




# Fitoplankton

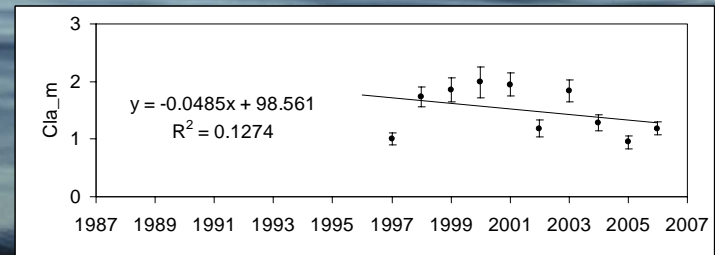
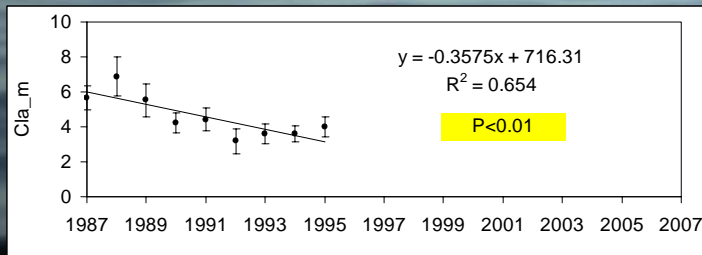
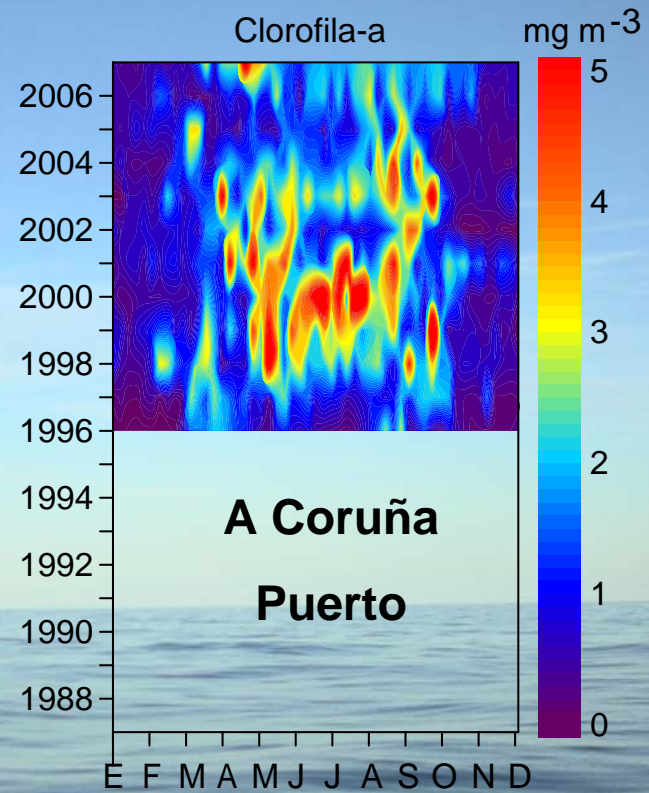
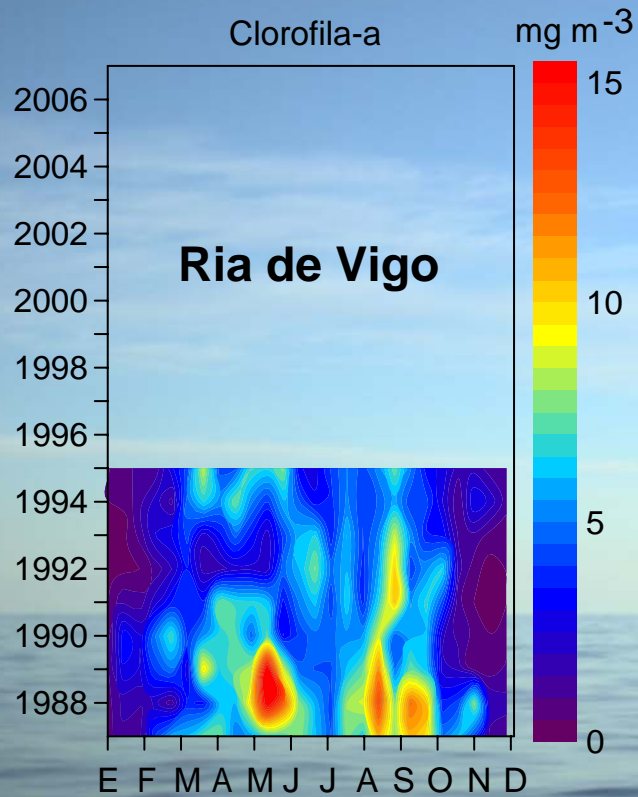


# Fitoplancton (1)





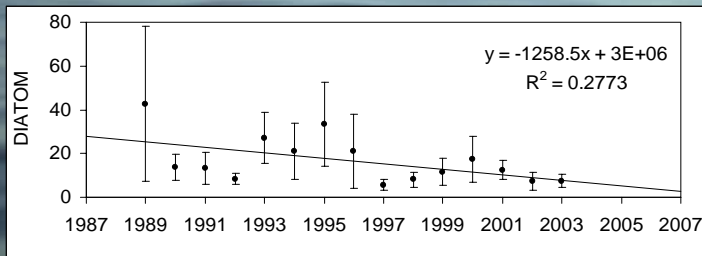
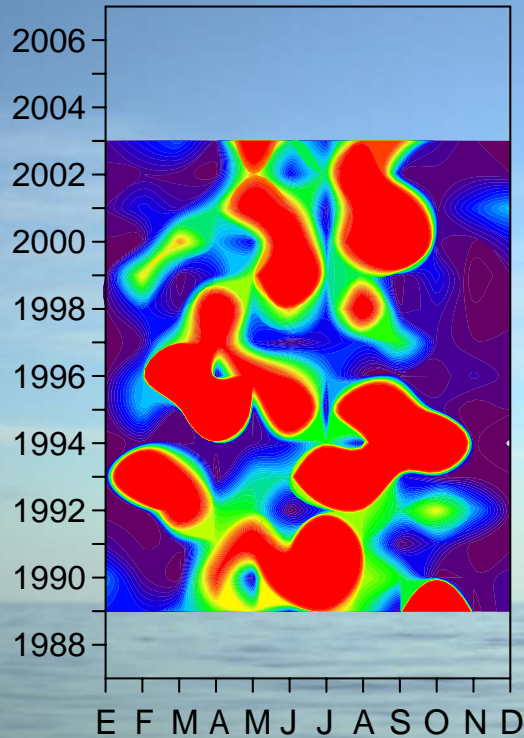
# Fitoplancton (2)



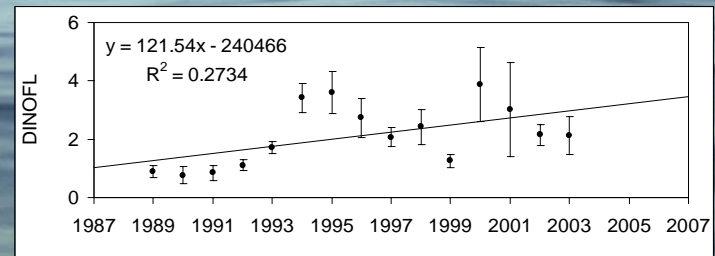
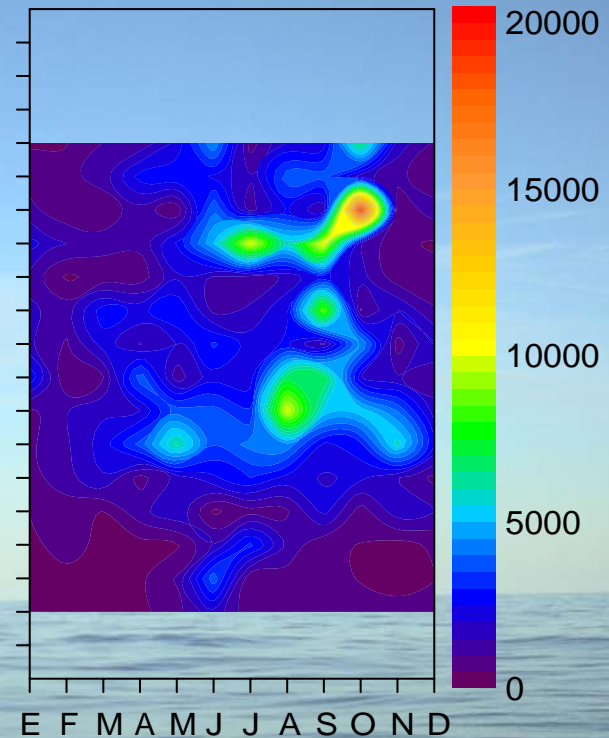


# Fitoplancton (3)

Diatomeas

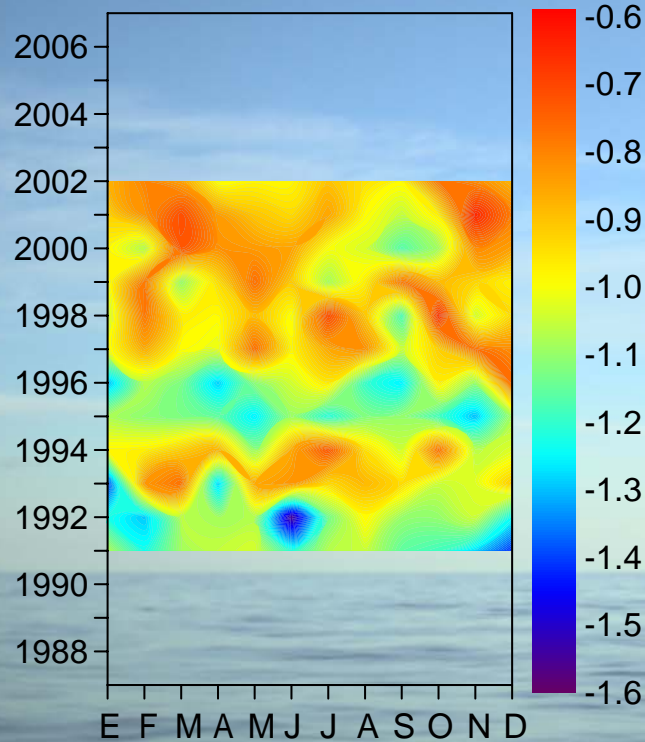


Dinoflagelados

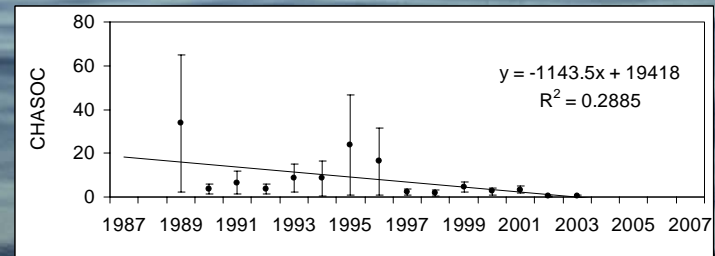
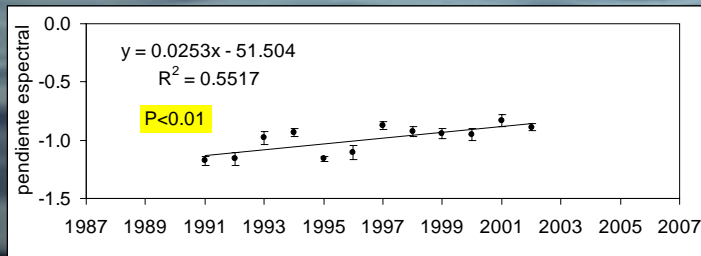
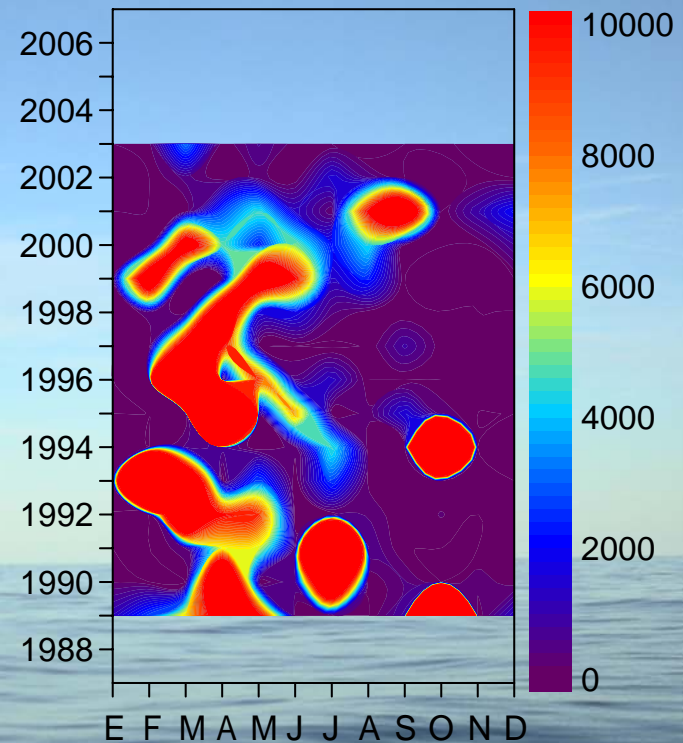


# Fitoplancton (4)

Pendiente espectro tamaños - A Coruña



Chaetoceros socialis  $\times 10^6 \text{ cel m}^{-2} (0-40 \text{ m})$

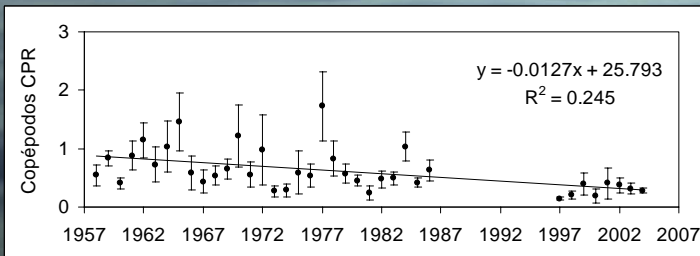
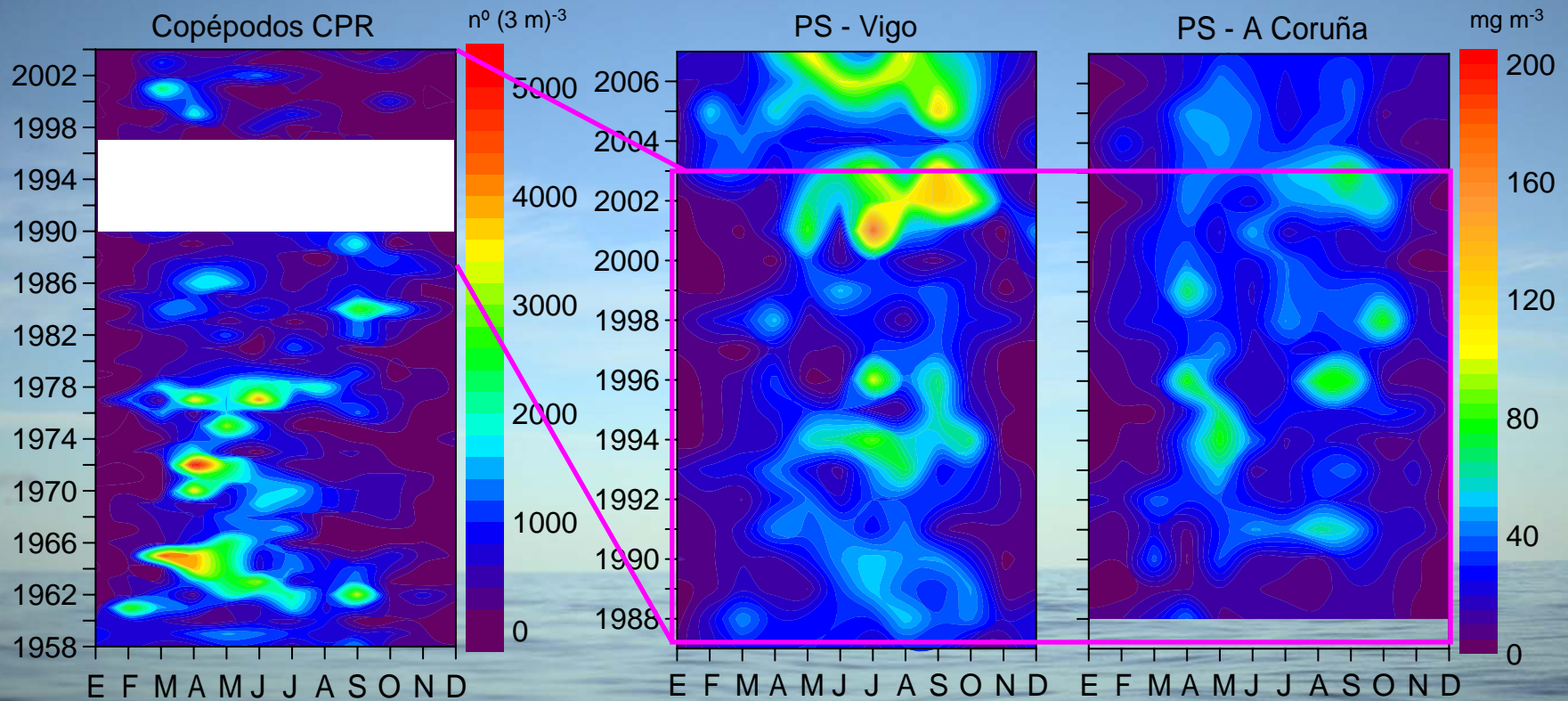


# Zooplankton

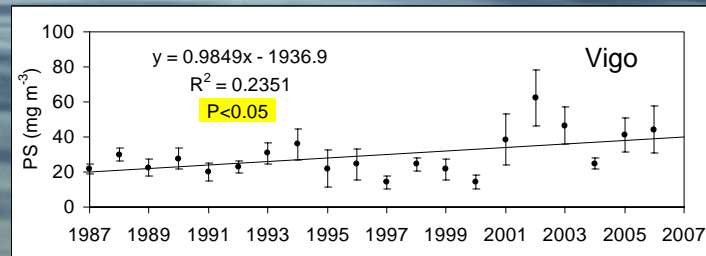




# Zooplankton (1)



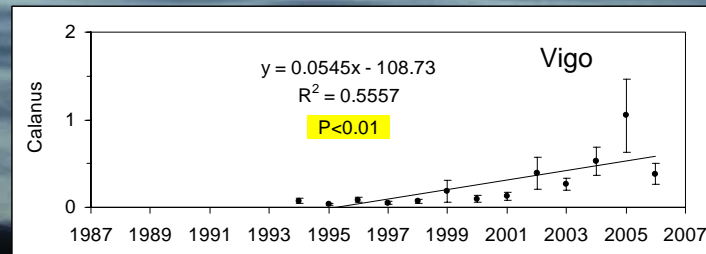
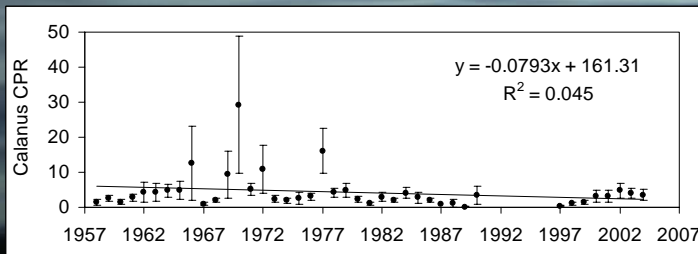
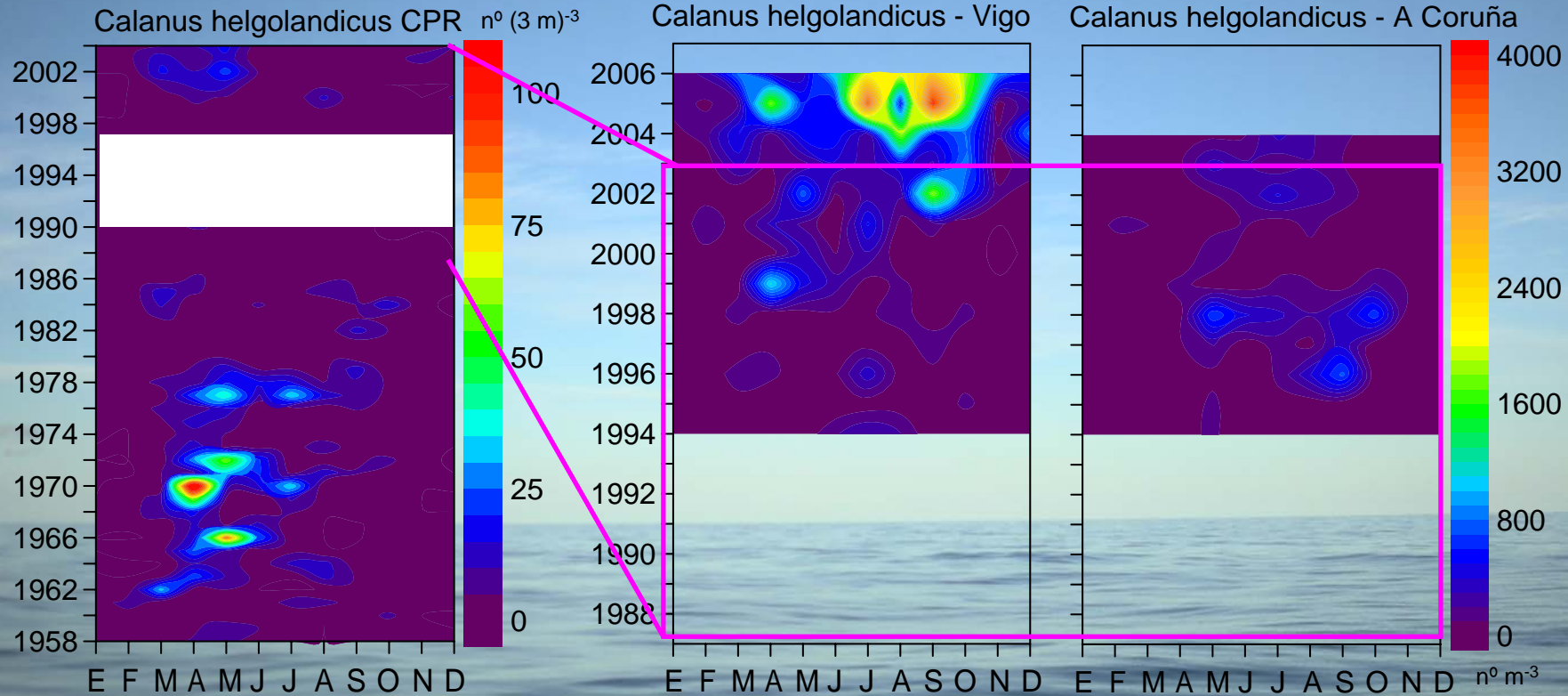
$\times 10^3 (3 \text{ m})^{-3}$



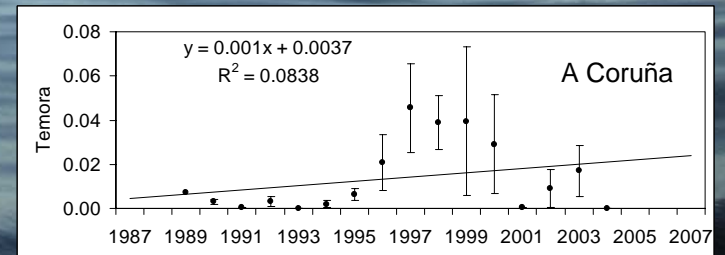
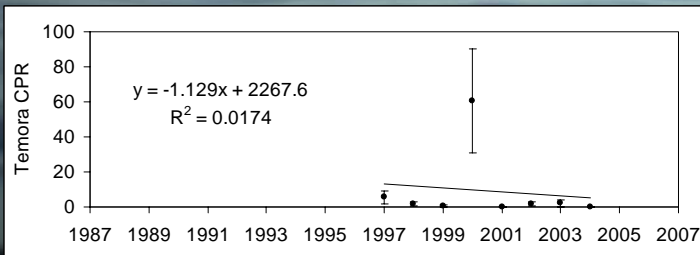
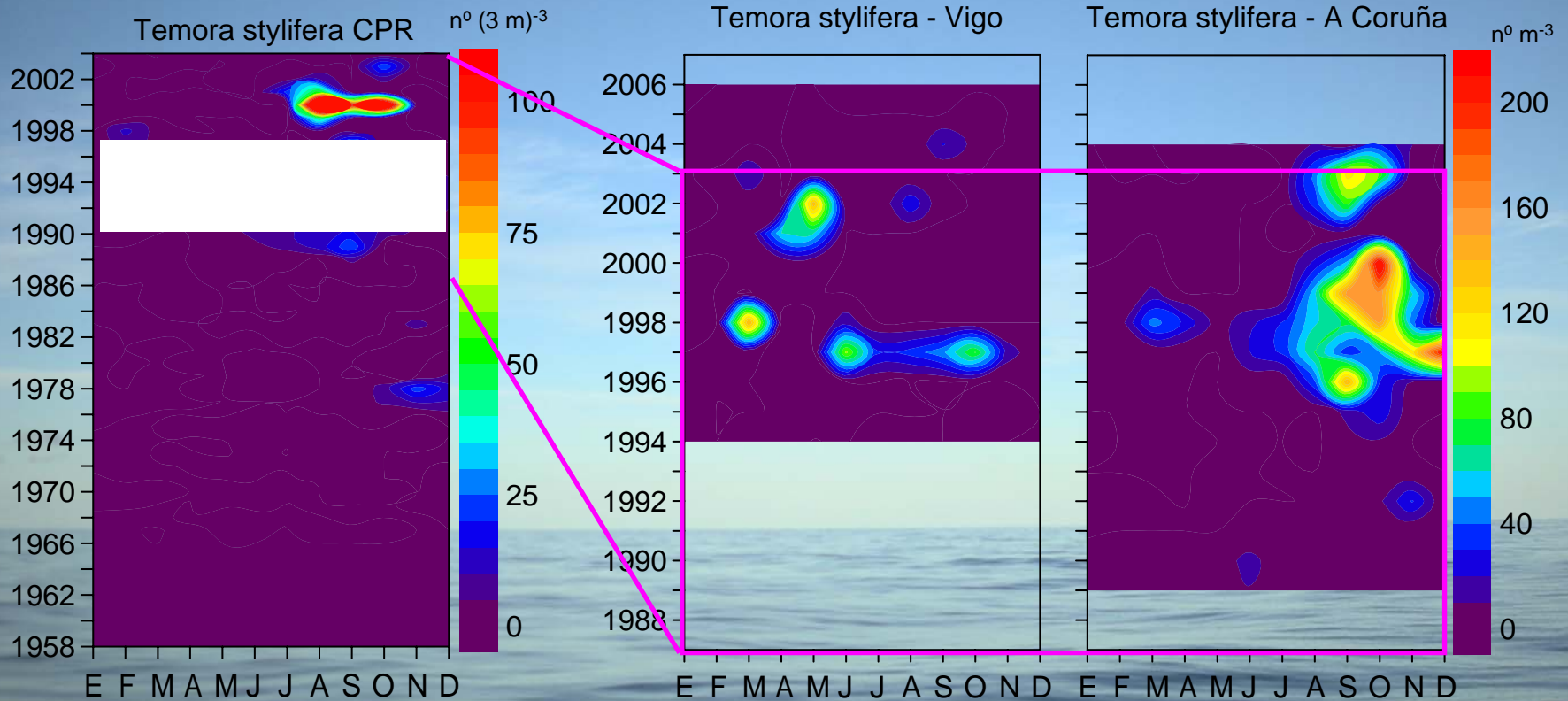
Vigo



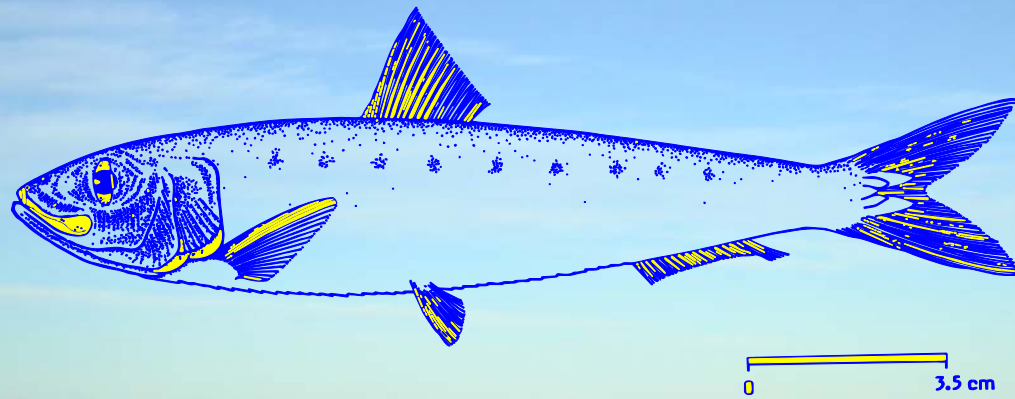
# Zooplankton (2)



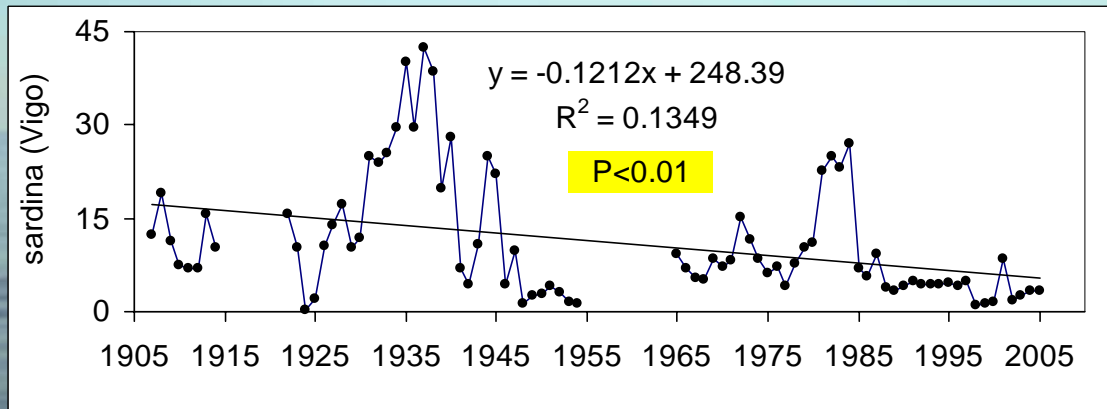
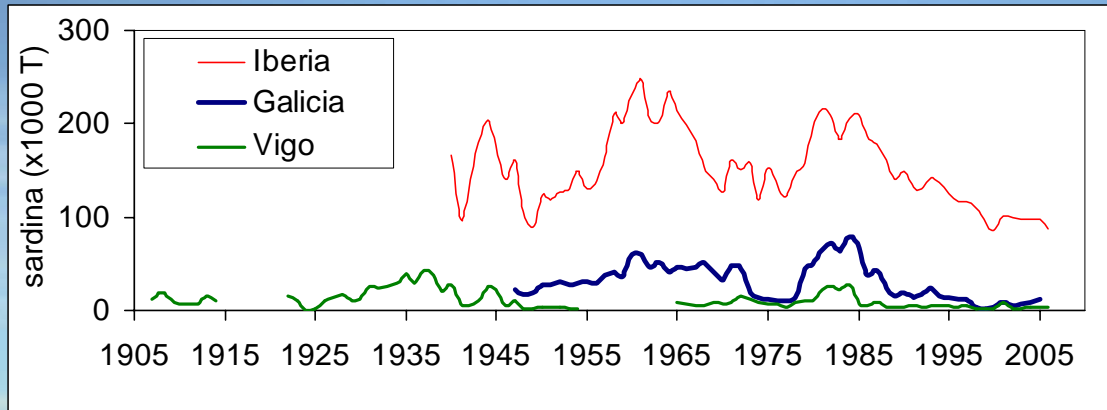
# Zooplankton (3)



# Sardina

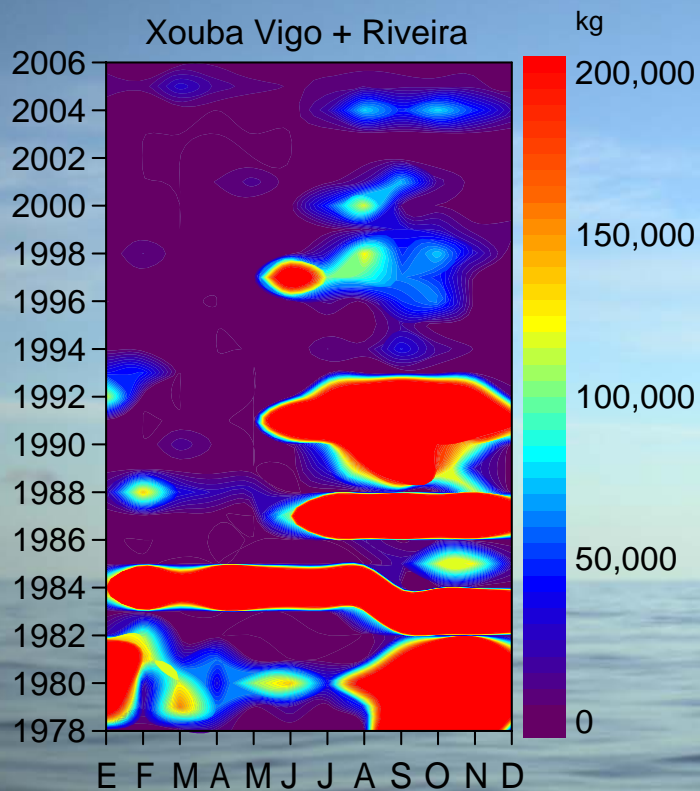


# Sardina (1)

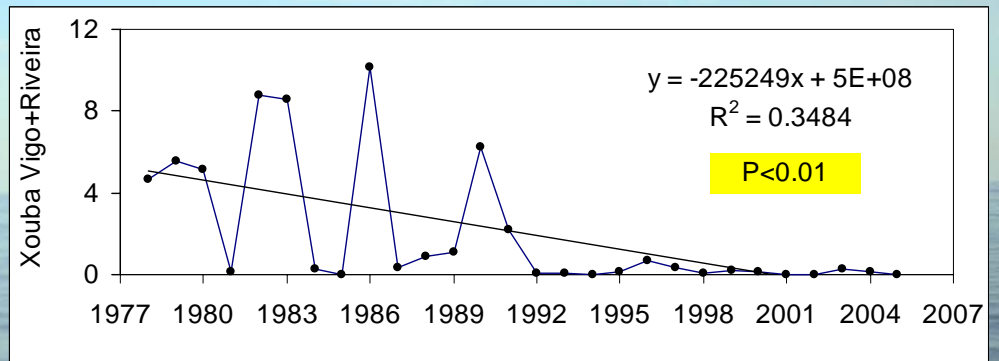




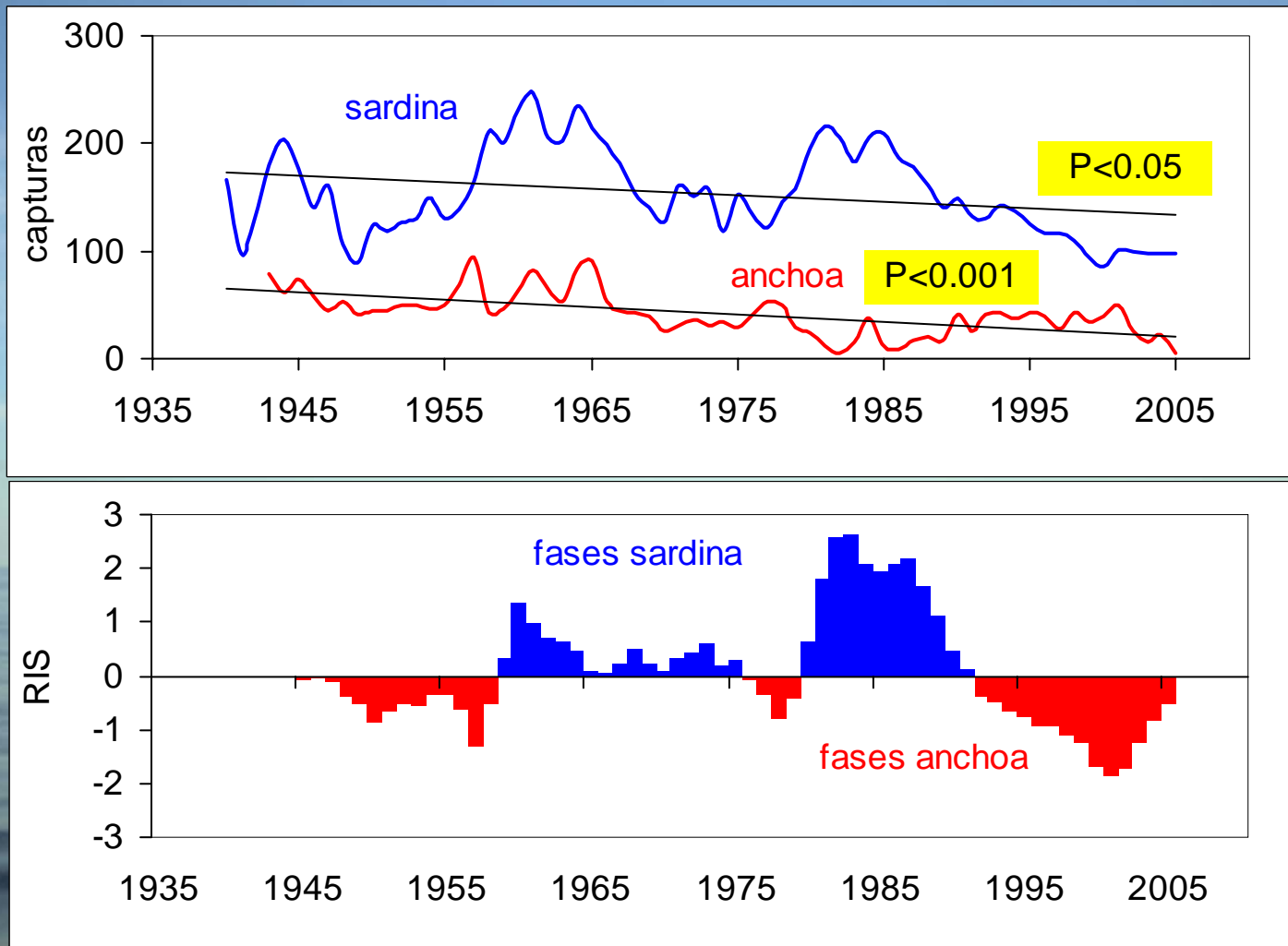
# Sardina (2)



X1000 T



# Sardina (3)



# Resumen

- Poblaciones muy fluctuantes
- Plancton:
  - Tendencias a largo plazo no significativas
  - Grandes diferencias locales (fito y zooplancton)
  - Disminuyen diatomeas y aumentan dinoflagelados
  - Mayor presencia de zooplancton de aguas cálidas
  - No hay evidencias de disminución de biomasa
- Sardina:
  - Descenso de capturas en el último siglo
  - Oscilaciones 14 años
  - Incertidumbre en la dependencia climática

# Coautores

## Fitoplancton

M. Varela (IEO)

F. Gómez Figueiras (IIM-CSIC)

M. Huete (UVigo)

E. Marañón (UVigo)

## Zooplankton

M.T. Alvarez-Ossorio (IEO)

A. Miranda (IEO)

## Sardina

J.M. Cabanas (IEO)

C. Porteiro (IEO)

M.B. Santos (IEO)