

# **RADIALES time series: 25 years building monitoring and analytical capacities in the Iberian shelf**

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<sup>1</sup>Instituto Español de Oceanografía (IEO), Spain

<sup>2</sup>Universidad de Oviedo, Spain



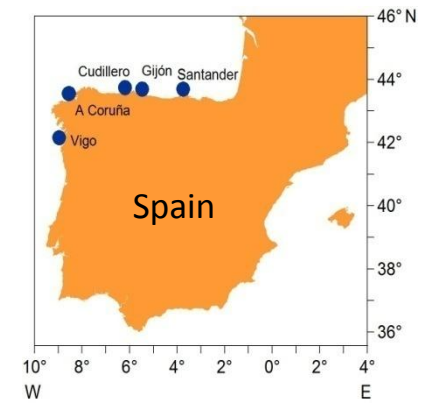
UN OCÉANO, UN FUTURO



Universidad  
de Oviedo

# Oceanographic time series in northern Spain (RADIALES)

1990 - 2014



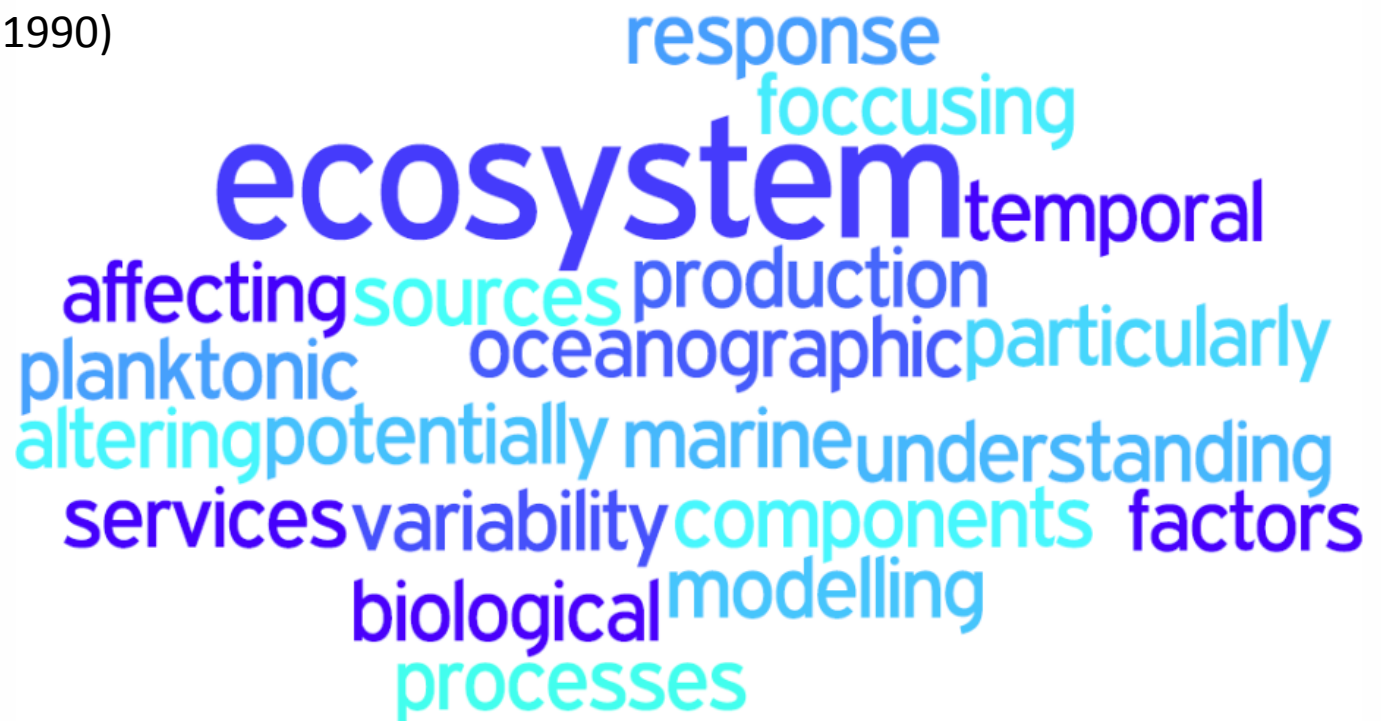
<http://www.seriestemporales-ieo.com/>

- 
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  - History
  - Methods
  - Funding
  - The series
  - Applications
  - Spin-offs and alliances
  - Products

# Objective

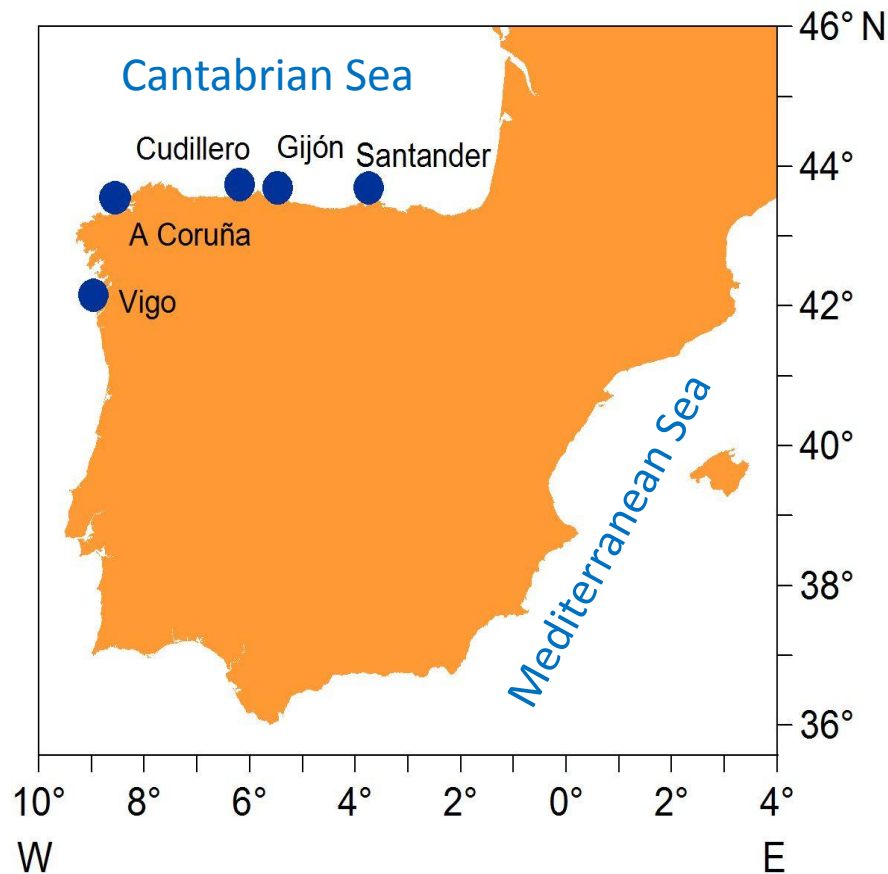
“understanding and modelling the response of the marine ecosystem to the sources of temporal variability in oceanographic and planktonic components, particularly focussing in those factors and processes affecting biological production and potentially altering the ecosystem services”.

(as formulated in 1990)



# History

the oldest multidisciplinary ocean observation initiative still active in Spain



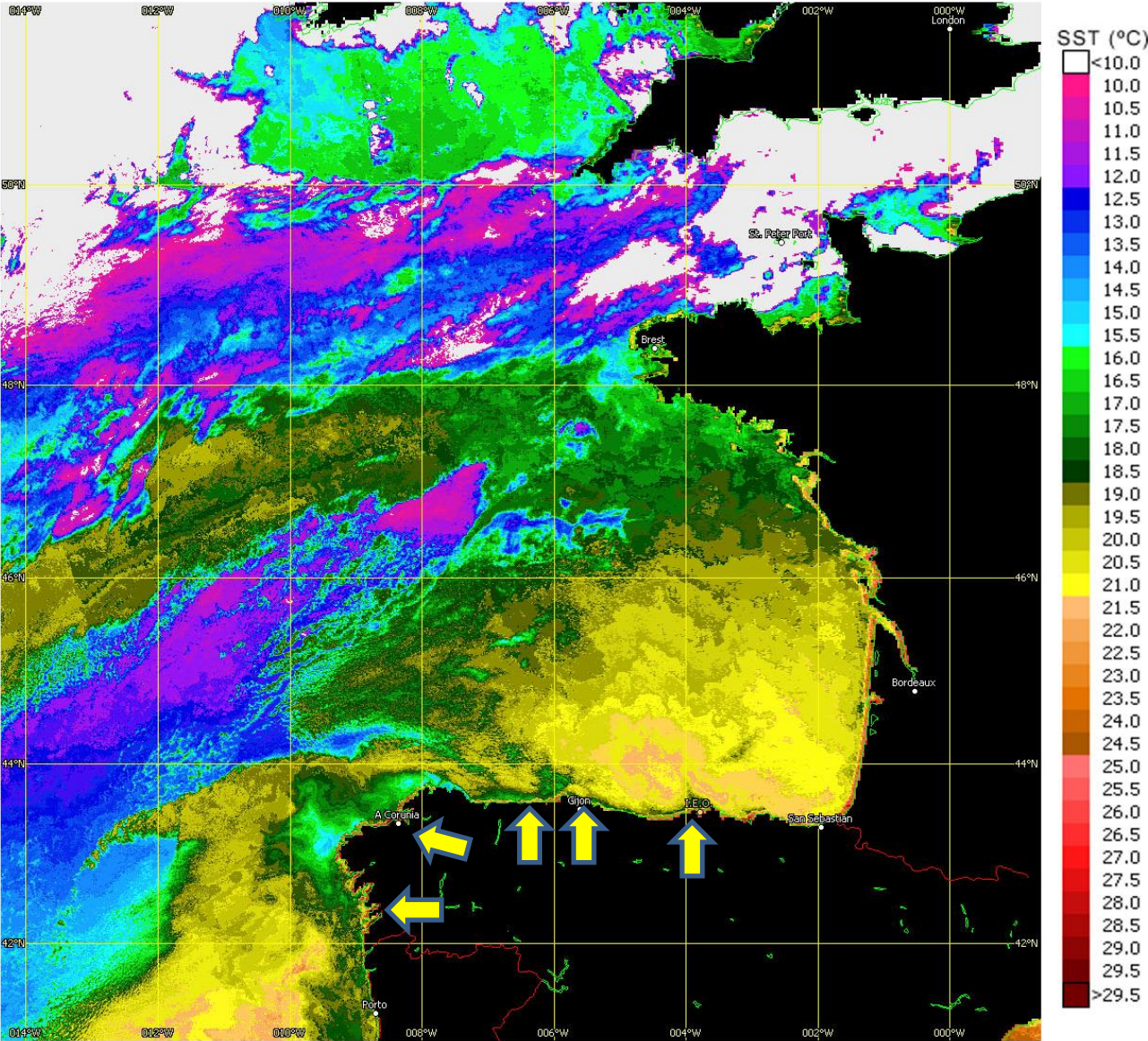
- 1987-1988. Periodic hydrographic observations started in Vigo and A Coruña
- 1990. Plankton observations included
- 1992-1997. Series extended to Cantabrian and Mediterranean waters
- 2007. Joint program for NW Spanish series (RADIALES)
- 2012. First multidecadal synthesis



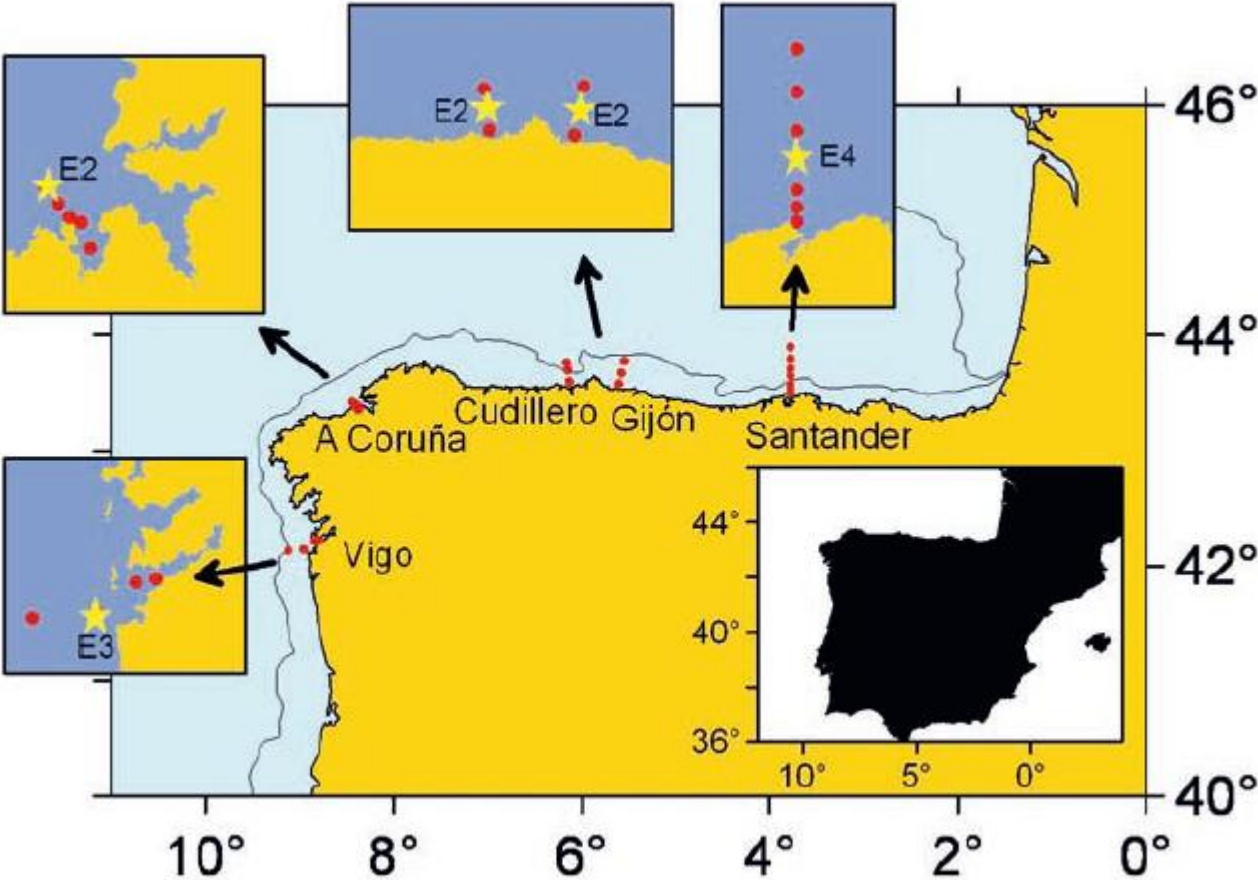
LURA

Methods

# Coastal upwelling gradient

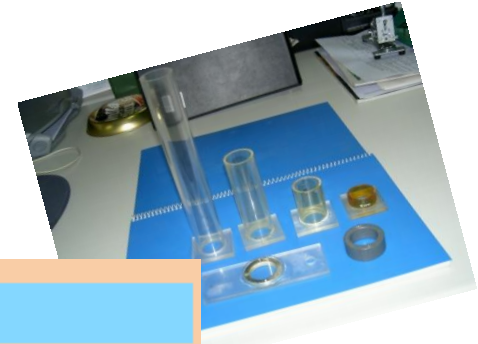
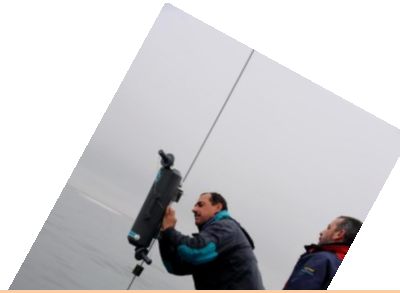


# Multi-station observatory

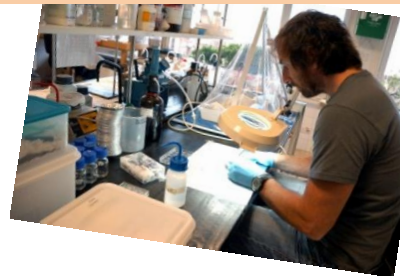
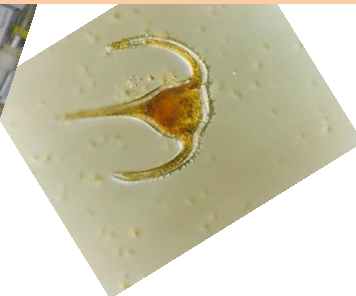
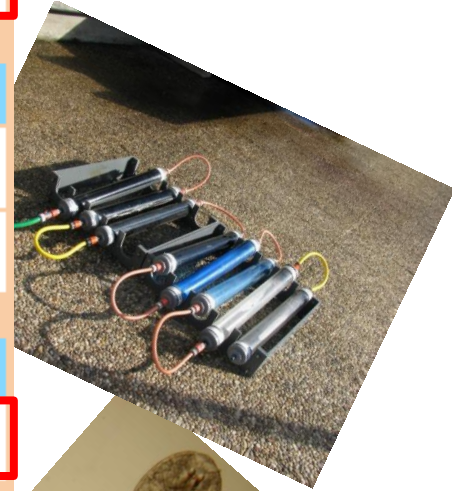




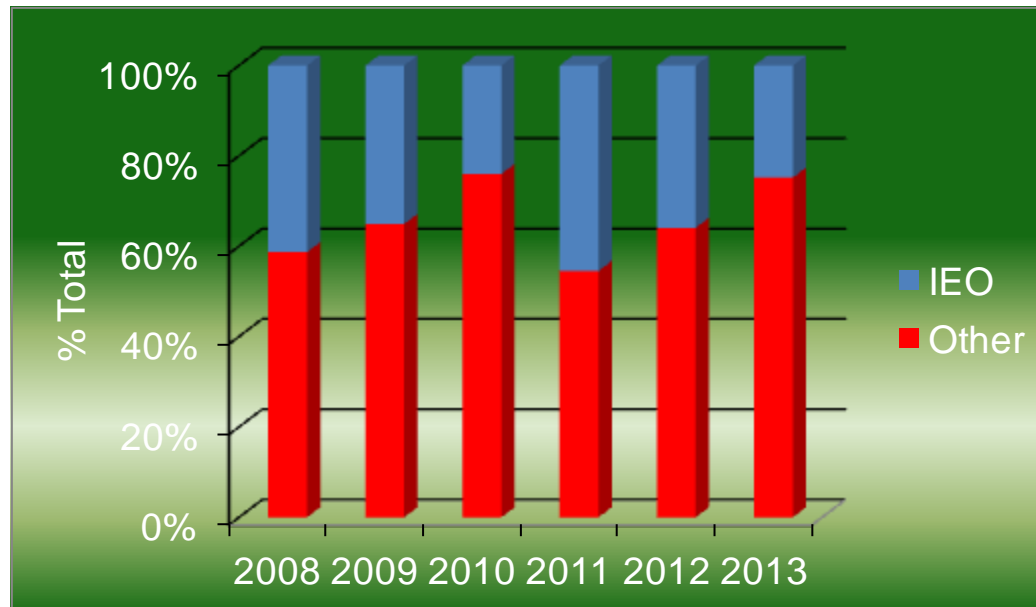
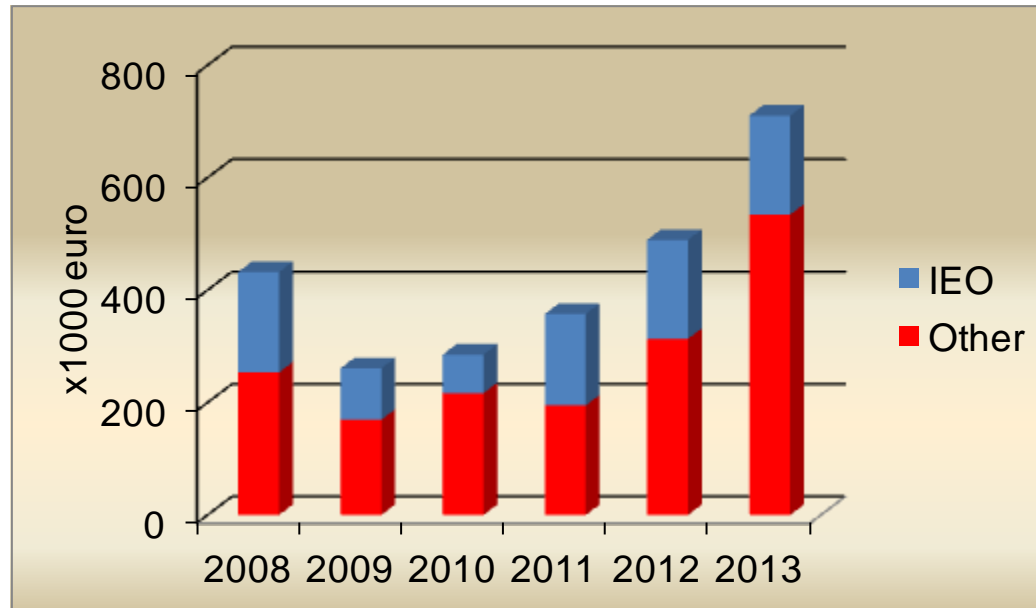
# Multidisciplinary observations:



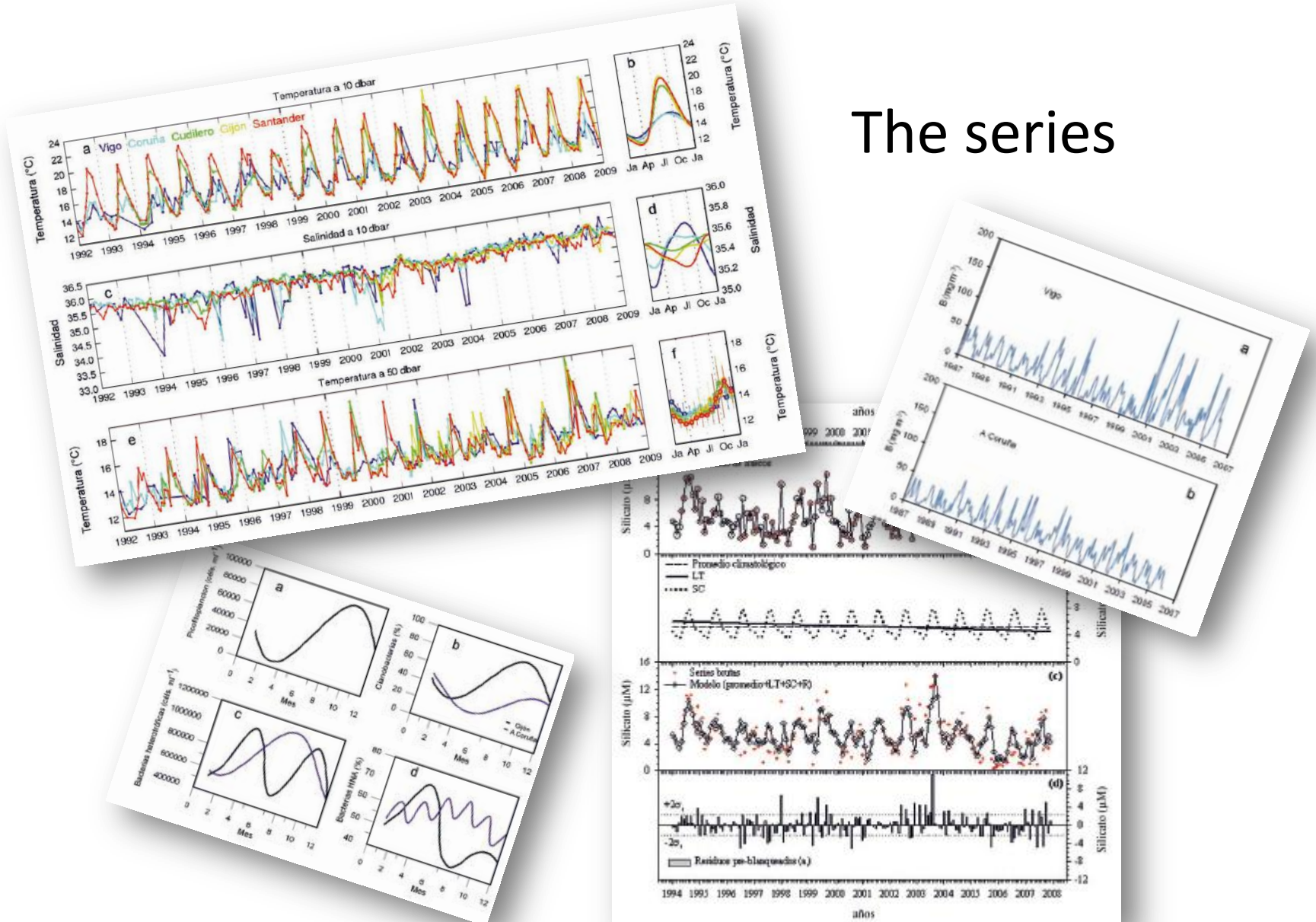
| Physical variables       |                    |               |
|--------------------------|--------------------|---------------|
| Irradiance               | Temperature        | Salinity      |
| Biogeochemical variables |                    |               |
| Nutrient salts           | Oxygen             | POM DOM       |
| Chlorophyll-a            | Primary production | Sedimentation |
| Biological variables     |                    |               |
| Bacterioplankton         | Phytoplankton      | Zooplankton   |
|                          | Ichthyoplankton    |               |



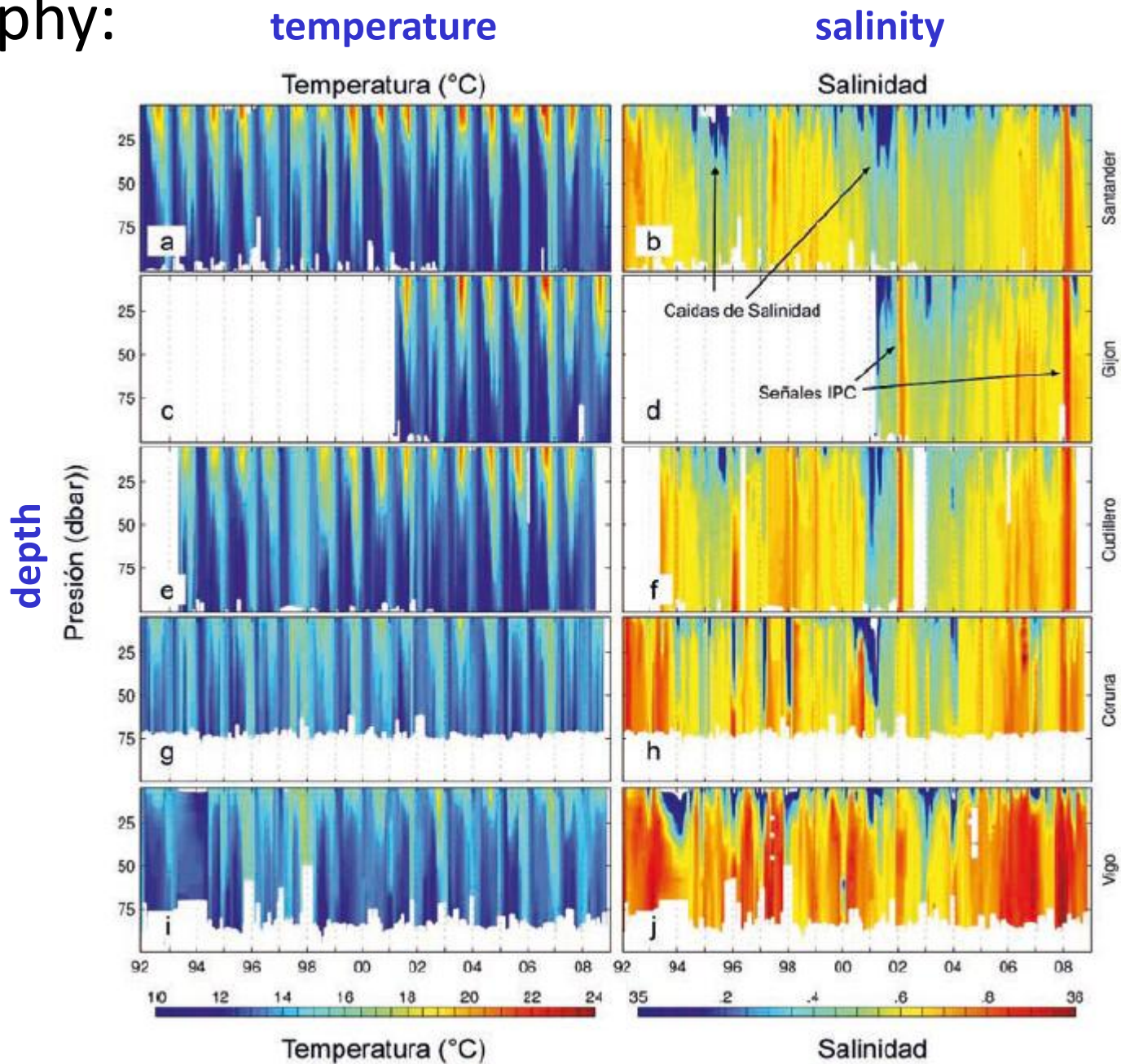
# Funding:



# The series

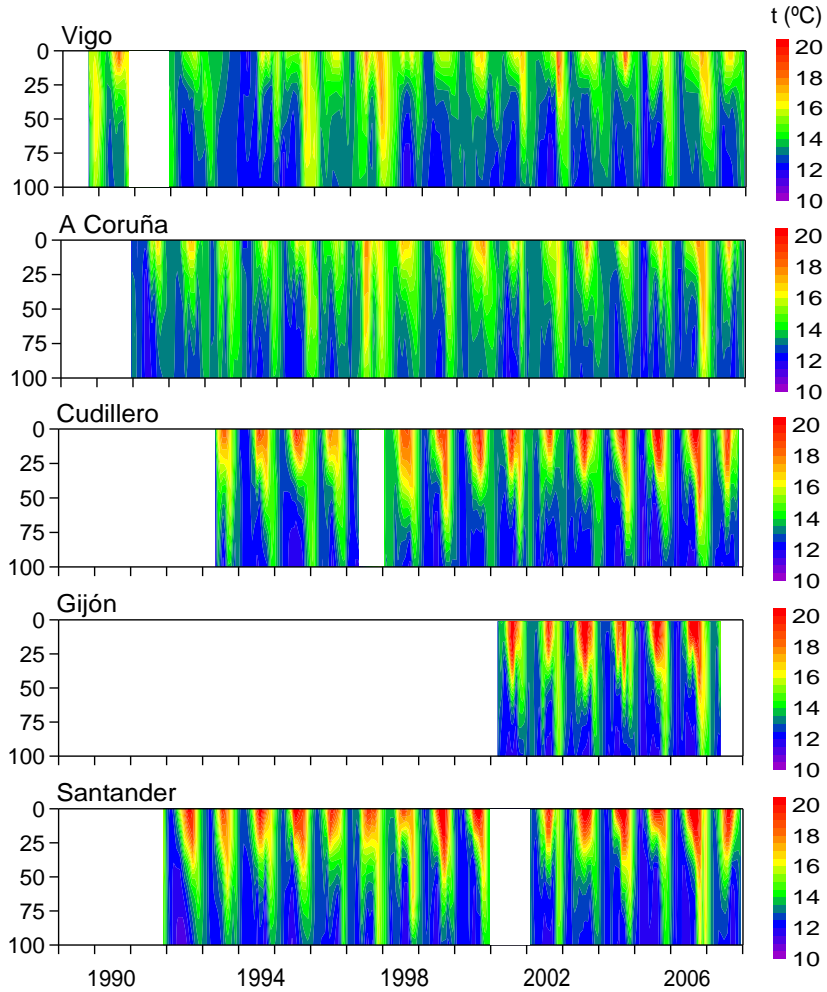


# Hydrography:

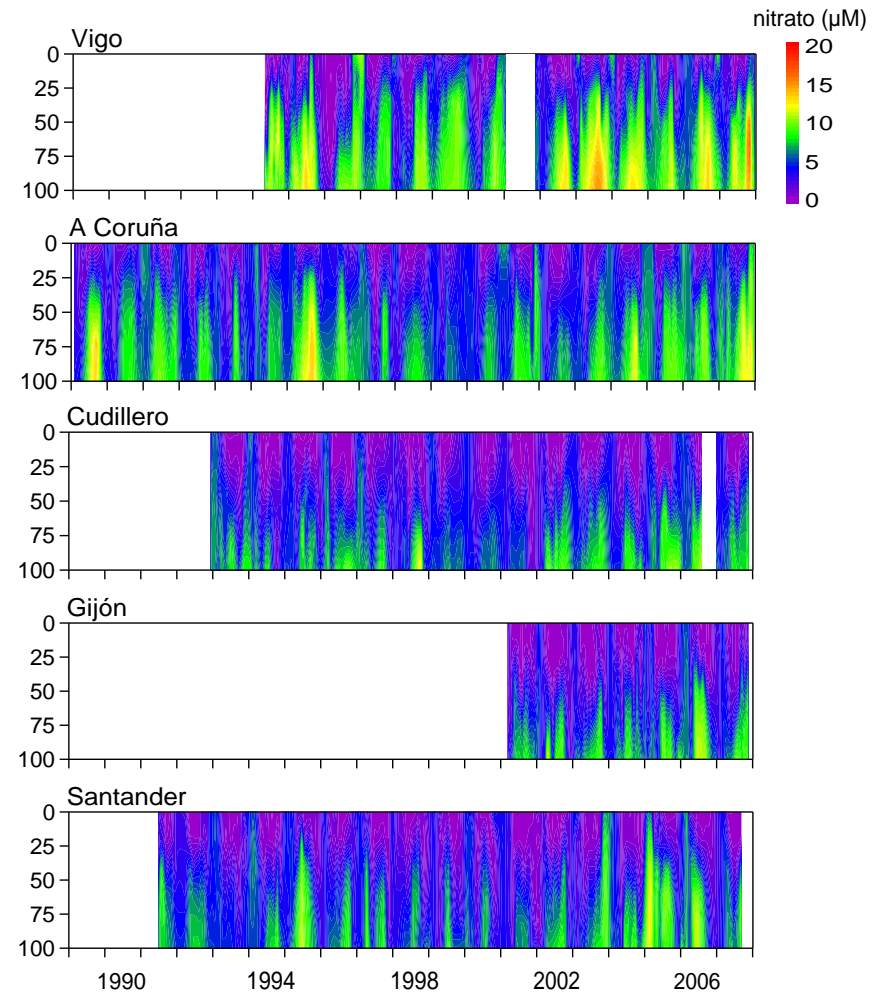


# Nutrients:

## temperature

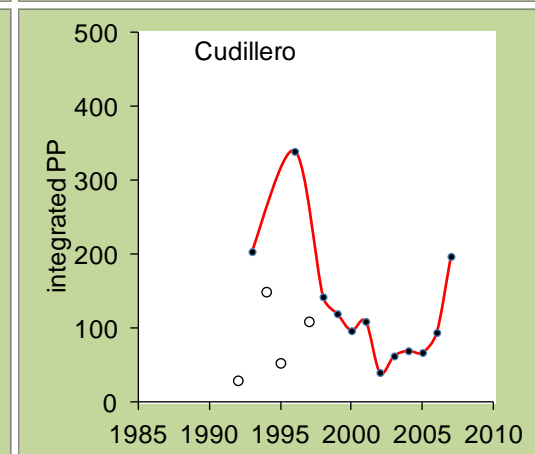
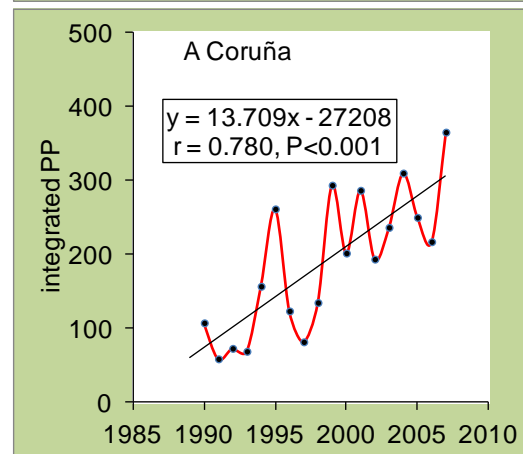
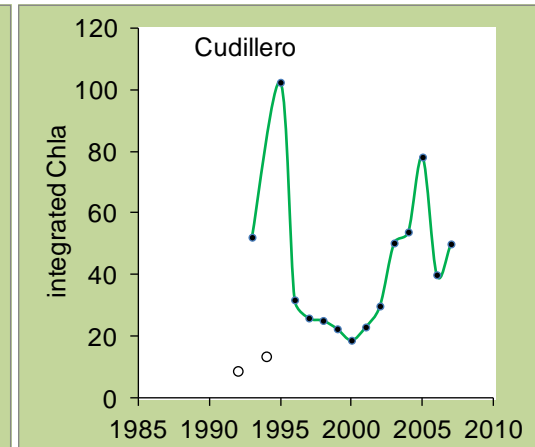
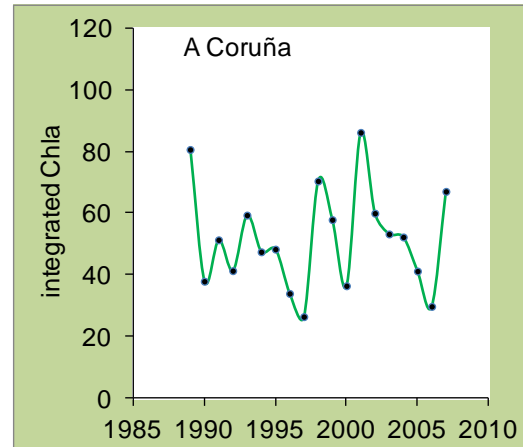
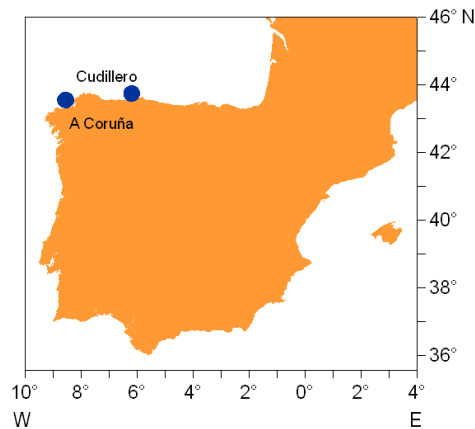


## nitrate

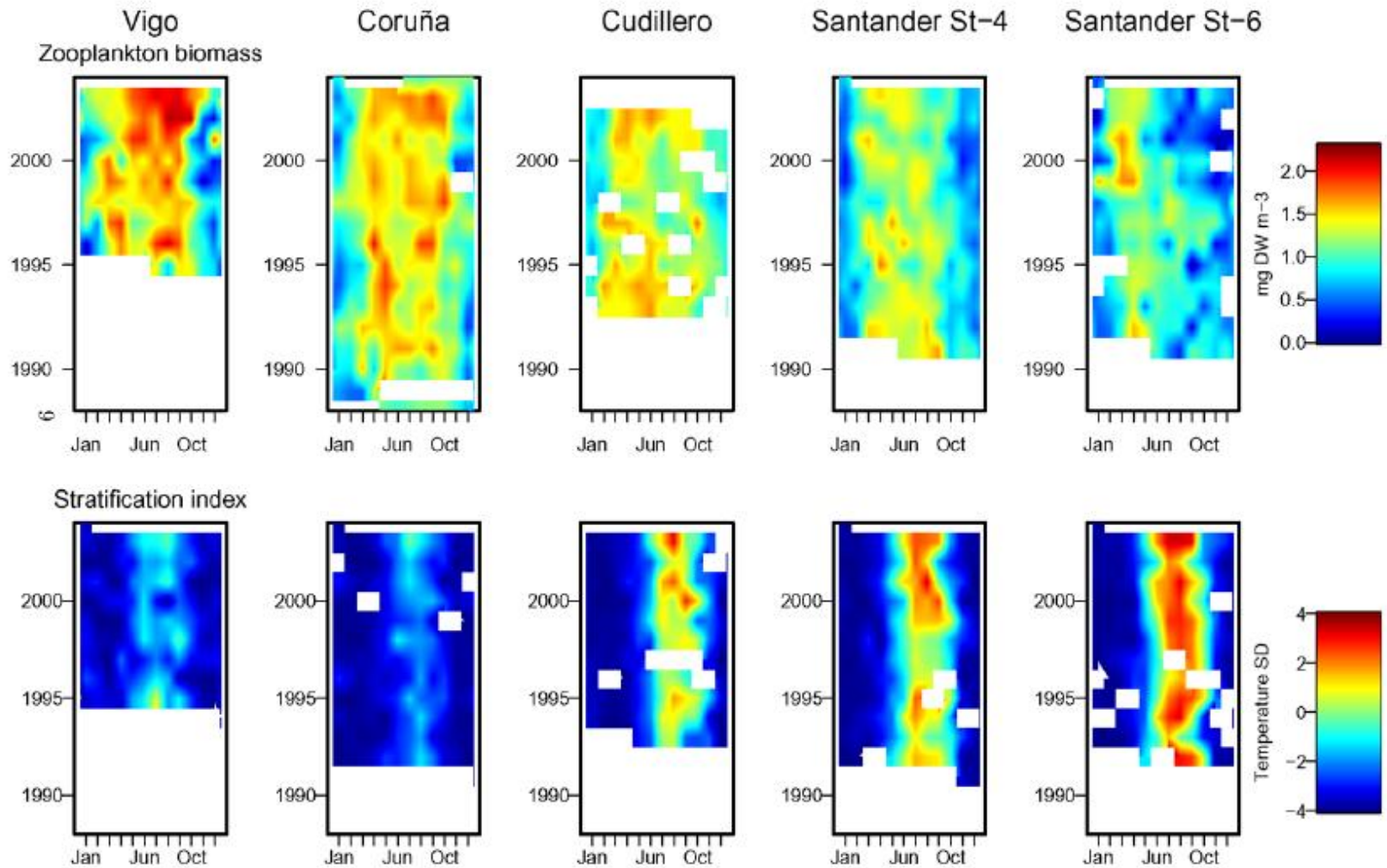


# Primary production and biomass

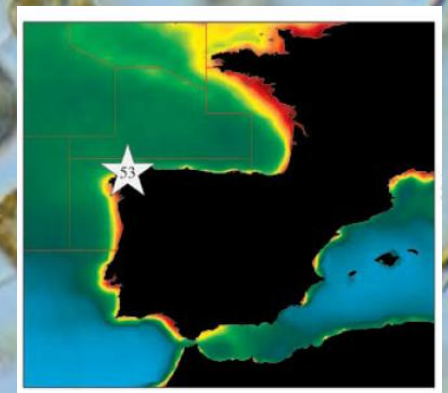
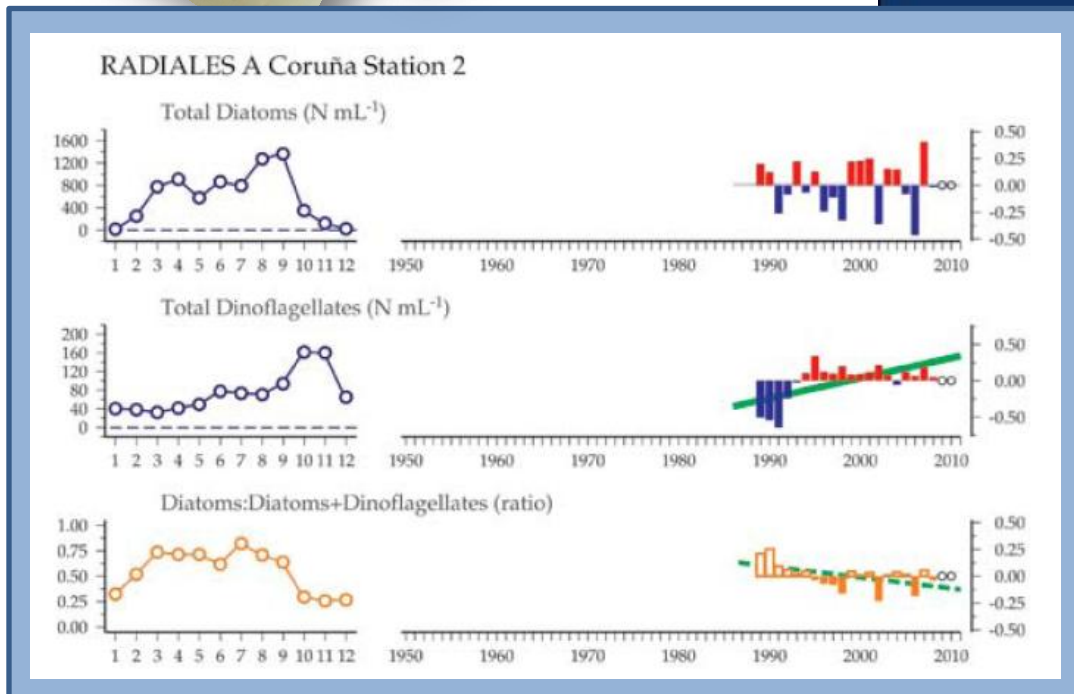
comparative analysis of trends and cycles in chlorophyll and primary production



# Zooplankton biomass

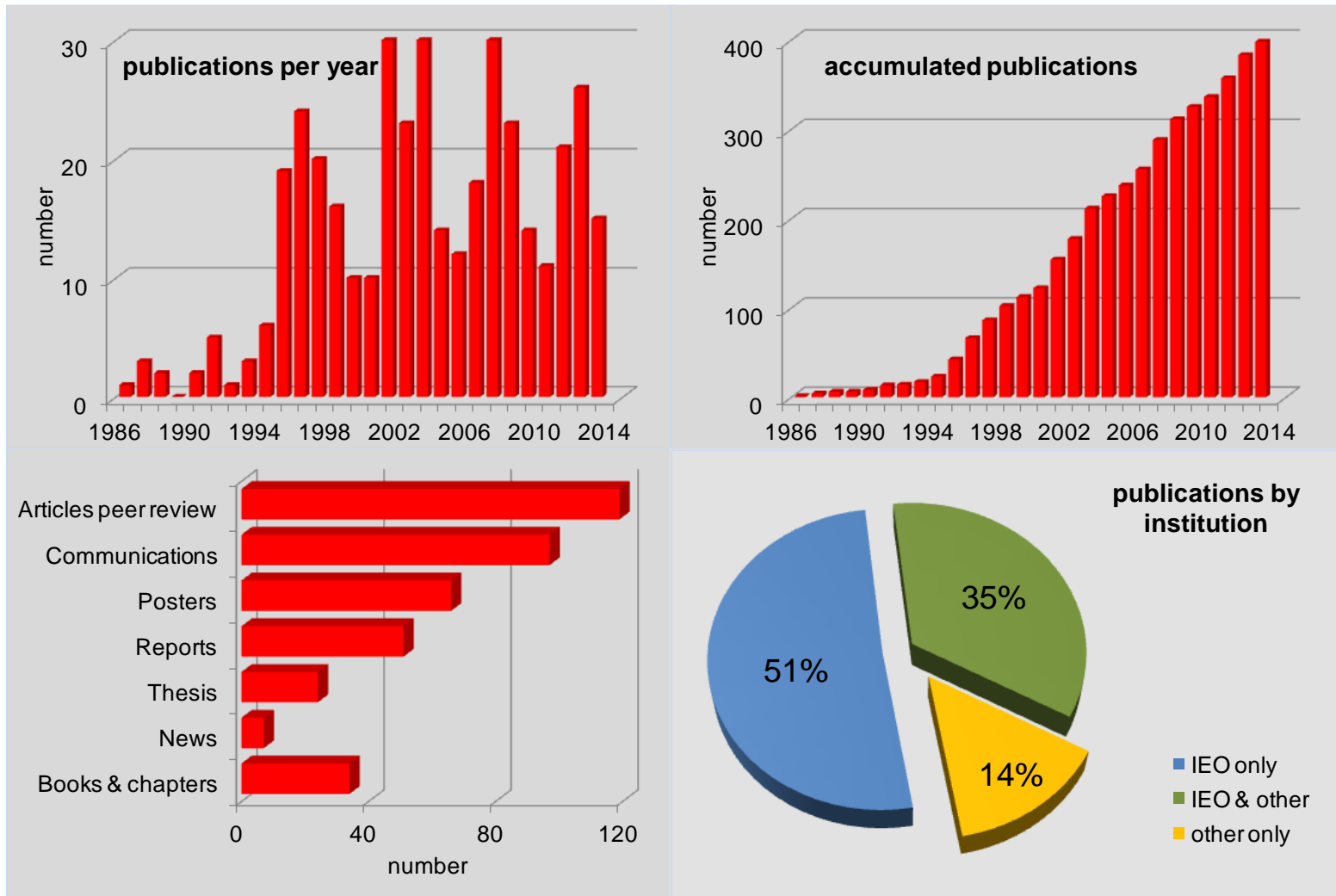


# Phytoplankton species

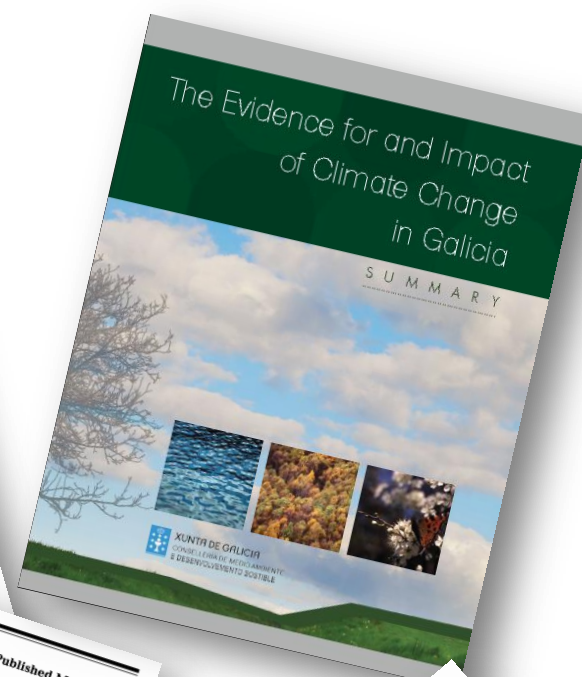
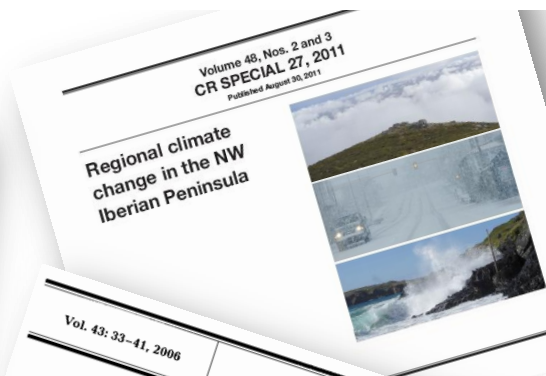




# Products: scientific publications



# Applications:



Published May 3

OPEN ACCESS

## Enhanced bacterioplankton activity after the 'Prestige' oil spill off Galicia, NW Spain

Antonio Bode\*, Nicolás González, Jorge Lorenzo, Joaquin Valencia, Marta M. Varela, Manuel Varela

AQUATIC MICROBIAL ECOLOGY  
Aquat Microb Ecol

Published February 28

## Seasonal dynamics of picoplankton in shelf waters of the southern Bay of Biscay

Alejandra Calvo-Díaz\*, Xosé Anxelu G. Morán

Instituto Español de Oceanografía (IEO), Centro Oceanográfico de Xixón, Cami de L'Archeval, s/n, 33212 Xixón, Spain



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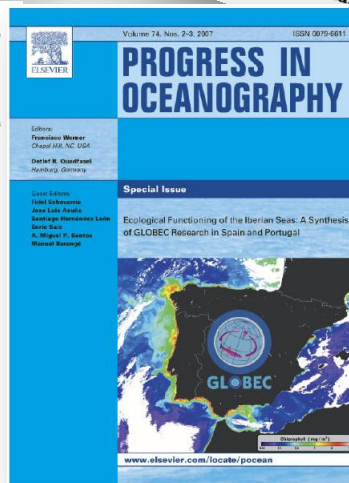
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Marine Pollution Bulletin 53 (2006) 272–286

MARINE POLLUTION BULLETIN

[www.elsevier.com/locate/marpolbul](http://www.elsevier.com/locate/marpolbul)



## The effect of the “Prestige” oil spill on the plankton of the N–NW Spanish coast

Manuel Varela <sup>a,\*</sup>, Antonio Bode <sup>a</sup>, Jorge Lorenzo <sup>a</sup>, M. Teresa Álvarez-Ossorio <sup>a</sup>, Ana Miranda <sup>b</sup>, Teodoro Patrocino <sup>b</sup>, Ricardo Anadón <sup>c</sup>, Leticia Viesca <sup>c</sup>, Nieves Rodríguez <sup>c</sup>, Luis Valdés <sup>d</sup>, Jesús Cabal <sup>d</sup>, Angel Urrutia <sup>d</sup>, Carlos García-Soto <sup>e</sup>, Menchu Rodríguez <sup>e</sup>, Xosé Antón Álvarez-Salgado <sup>f</sup>, Steve Groom <sup>g</sup>

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<sup>e</sup> Instituto Español de Oceanografía, Promontorio de San Martín s/n, Santander, Spain

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<sup>g</sup> Plymouth Marine Lab., Prospect Place, The Hoe, Plymouth PL1 3DH, United Kingdom

# Spin-offs and alliances:



Inicio Especificaciones Datos Históricos Últimos datos Productos FixO<sup>3</sup> Publicaciones Contacto

14 Noviembre 2014 : Idioma/Language ESP ENG

BOYA AGL  
Santander

Boya Océano-meteorológica Augusto González de Linares

Últimos valores

**IBI-ROOS**  
Iberia-Biscay-Ireland Regional Operational Oceanographic System

HOME OVERVIEW OBSERVING SYSTEMS ACCESS TO DATA NEWS & MEETINGS

**Ireland-Biscay-Iberia Regional Operational Oceanographic System**

The goal of IBI-ROOS is to set up an operational oceanography organisation operated by participating partners from the 5 countries bordering the Iberian-Biscay-Irish maritime area ( France, Ireland, Portugal, Spain and UK), collaborating to develop and implement ocean observing systems for the IBI-ROOS area, with delivery of real time operational data products and services.

COOPERAÇÃO TRANSFRONTEIRIZA  
E S P A - P O R T U G A L  
COOPERAÇÃO TRANSFRONTEIRIZA

Observatorio Oceanográfico Da Marxe Ibérica

Galego Castellano Português English

**VACLAN**

**Grupo mediterráneo de Cambio Climático del Instituto Español de Oceanografía**

Barcelona  
Tarragona  
Mahón  
Canales  
Cabrera  
Sacratif  
C. Gate

Latitud

Longitud

**RAIA**  
Observatorio Oceanográfico Da Marxe Ibérica

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Home

RAIA Allows to the users consult data of interest offered by the distinct partners that participate in the project

Predicción de temperaturas (Modelo WRF de Meteogalicia)

Radar HF

Datos de Boías

This project is the result of a common strategy developed by two regions with the ambition of reaching a deeper understanding of the ocean. Within the project, different partners with operational, technological and scientific background have come together. In all cases, existing projects in operational oceanography in which they are involved provide experience of the marine environment and a point of departure for this trans-frontier collaboration. The results of these projects for the region of the northwest Iberian Peninsula (some of which are detailed below) will be available for the developments outlined here.

# RADIALES: the numbers



3 oceanographic ships  
5 oceanographic sections  
23 sampling stations  
24 scientists  
25 ship crew  
28 technicians & students  
423 keuro/year (>60% external funds)  
398 scientific publications

7 News  
24 Thesis  
34 Books and chapters  
51 Reports  
66 Posters  
97 Communications  
119 Articles peer review



<http://www.seriestemporales-ieo.com/>

Series Temporales.

Oceanographic time series in northern Spain (RADIALES)

GOBIERNO DE ESPAÑA  
MINISTERIO DE CIENCIA E INNOVACION

INSTITUTO ESPAÑOL DE OCEANOGRAFÍA

Introducción

Estrategia de muestreo

Metodología

Gestión del proyecto

Resultados

Galería de imágenes

Talleres, cursos y congresos

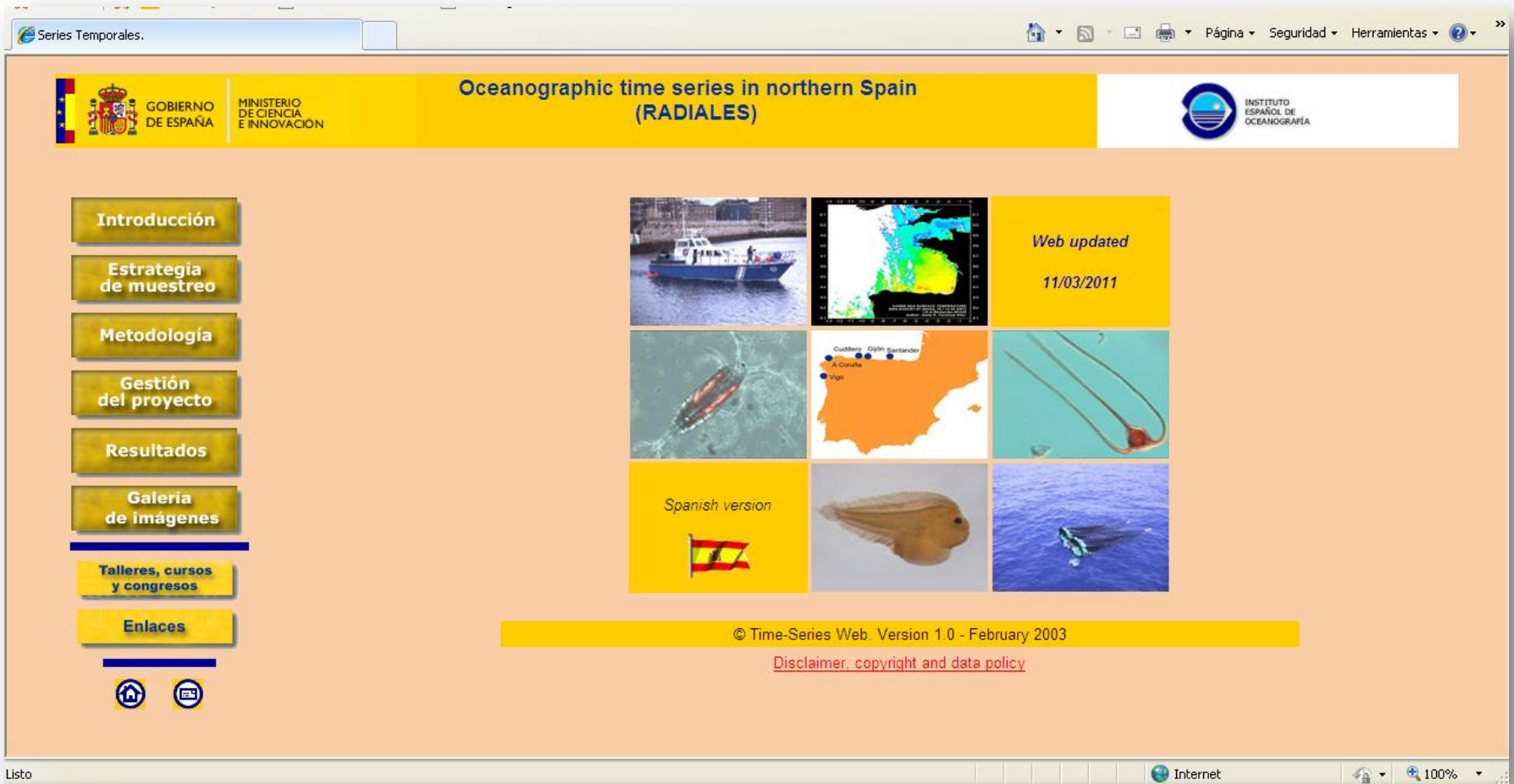
Enlaces

Web updated  
11/03/2011

Spanish version

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The screenshot shows a web browser window displaying the website 'Series Temporales'. The browser's address bar shows the URL 'http://www.seriestemporales-ieo.com/'. The website has a yellow header with the title 'Oceanographic time series in northern Spain (RADIALES)'. On the left, there is a vertical navigation menu with buttons for 'Introducción', 'Estrategia de muestreo', 'Metodología', 'Gestión del proyecto', 'Resultados', 'Galería de imágenes', 'Talleres, cursos y congresos', and 'Enlaces'. The main content area features a grid of images: a boat, a map of northern Spain with sampling locations (Culleredo, Oporto, Santander, A Coruña, Vigo), a net, a jellyfish, and a fish. A yellow box on the right indicates the website was updated on 11/03/2011. At the bottom, there is a copyright notice for '© Time-Series Web. Version 1.0 - February 2003' and a link to 'Disclaimer, copyright and data policy'. The browser's status bar at the bottom shows 'Listo' and 'Internet'.