



Programa de ciencias mariñas de Galicia

PLATAFORMA INTEGRADA DE DATOS MARIÑOS

Ponente(s): Manuel Ruiz Villarreal, IEO-CSIC



Financiado por
la Unión Europea
Next Generation EU
FEMP-FEMPA



GOBIERNO
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MINISTERIO
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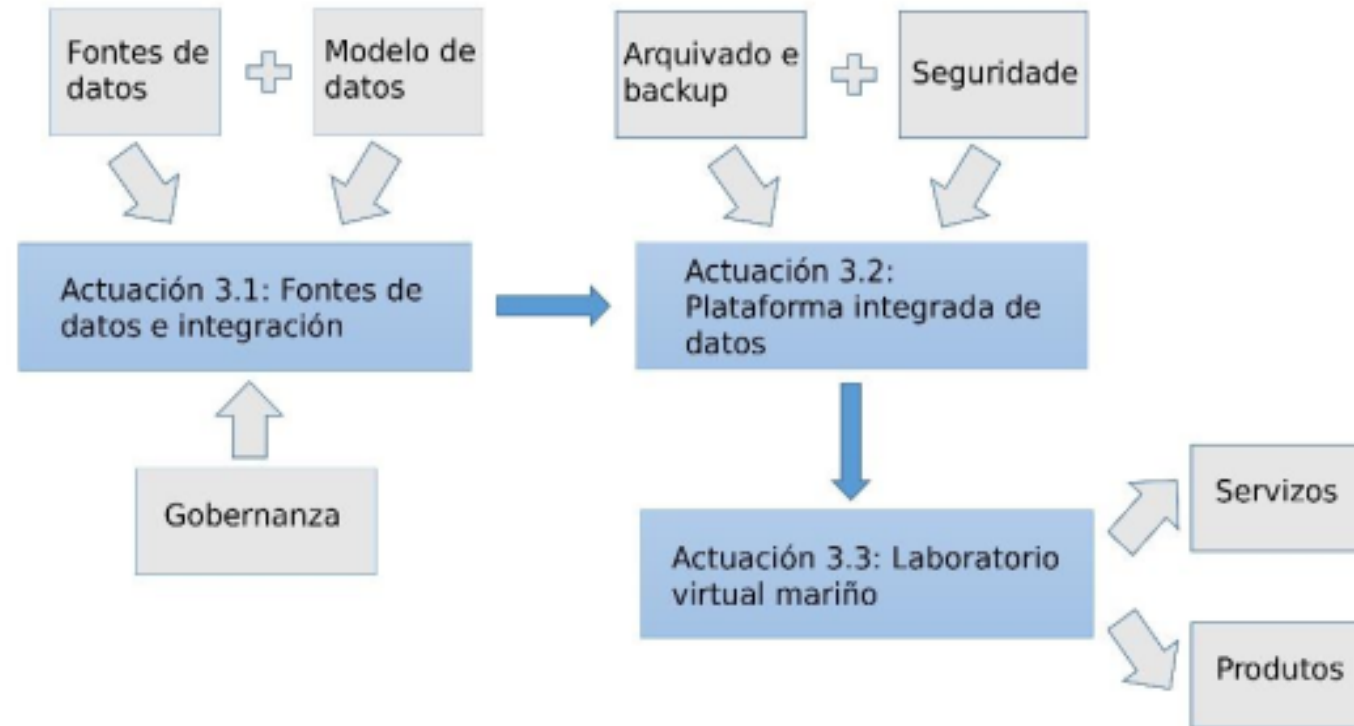


Plan de
Recuperación,
Transformación
y Resiliencia



XUNTA
DE GALICIA

PLATAFORMA INTEGRADA DE DATOS MARIÑOS



Demostrar a mellora na xestión dos datos mariños usando tecnoloxías de High Performance Computing (HPC) nunha plataforma de integración que permita o acceso a **distintas fontes de datos** nun entorno HPC.

PELACUS Campaña de Primavera desde los 80 (Fontes de datos)

Apicals



Marine Litter



Microplastics



Meteorology



Phyto and Zooplankton

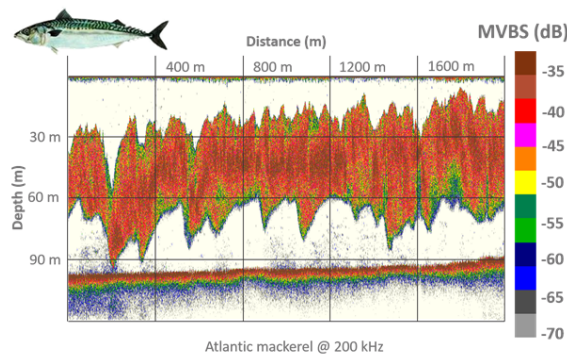


TSG

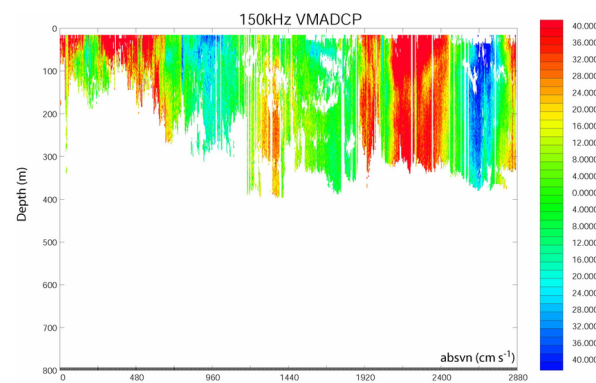


CUFES

Acoustics



VADCP



Rosette-CTD

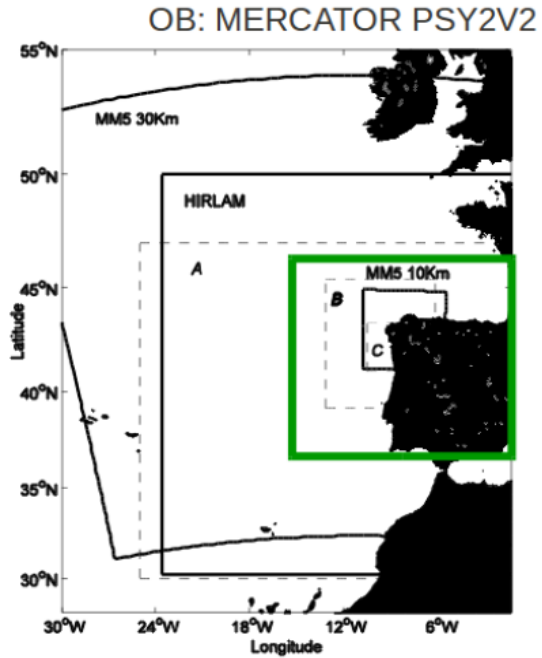


Fish



A Lagrangian IBM for the Iberian Atlantic Sardine

Hydrodynamic model



Hydrodynamics+Biogeochemistry

- ROMS Rutgers version 3.5
- 30 vertical levels
- 3.5km horizontal resolution.
- Rivers
- Simulated period: 2005-2006-2007 and 2012-2013 **2006-2020 iFADO**

N2PZD2

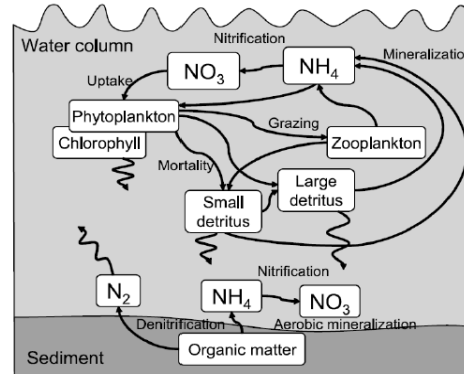


Figure 1. Biological model schematic.

Biogeochemical model



A biophysical model for simulating early life stages of sardine in the Iberian Atlantic stock

Luz María García-García^{a,1}, Manuel Ruiz-Villarreal^{a,*}, Miguel Bernal^b

Lagrangian model (offline)



Ichthyop



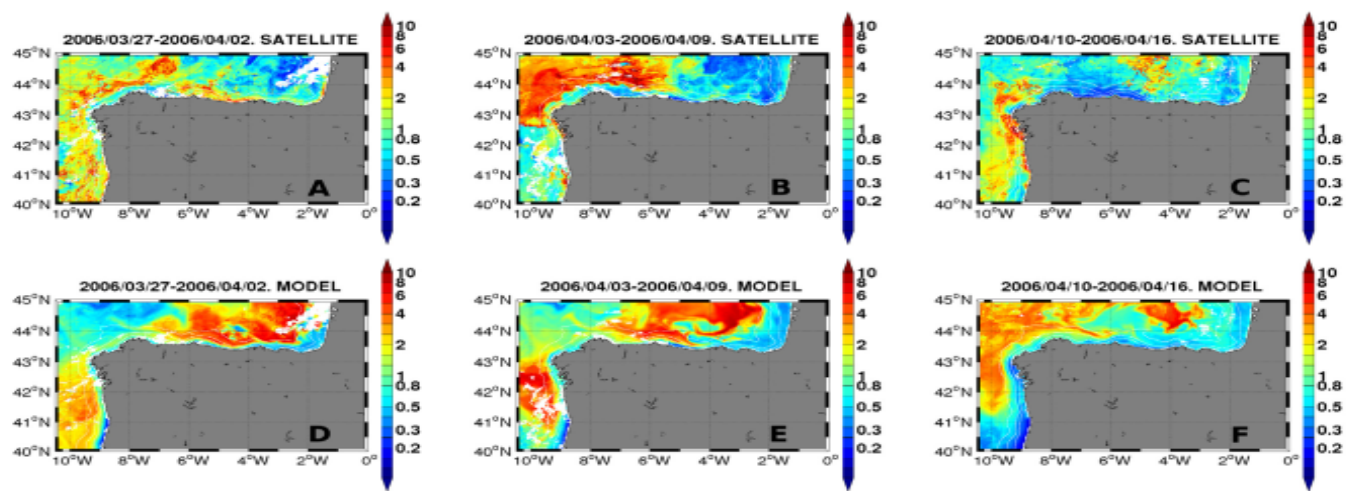
OpenDrift

Early Life Stages

	Egg (<2.8 mm)	Yolk-sac larva (2.8–4.5 mm)	Feeding larva (>4.5 mm)
Physical processes			
Horizontal advection	×	×	×
Vertical advection	×	×	×
Horizontal dispersion	×	×	×
Vertical dispersion	×	×	×
Biological processes			
Temperature dependent development/growth	×	×	
Food limitation (LTL model)			×
Development dependent buoyancy	×		
Vertical migration			×

PENDECO project RES (Spanish SuperComputing Network): Storage

A Lagrangian IBM for the Iberian Atlantic Sardine: Description of environment



Chl-a weekly concentrations in spring:
satellite vs model

Vol. 708: 45–78, 2023
<https://doi.org/10.3354/meps14236>

MARINE ECOLOGY PROGRESS SERIES
Mar Ecol Prog Ser

Published March 23

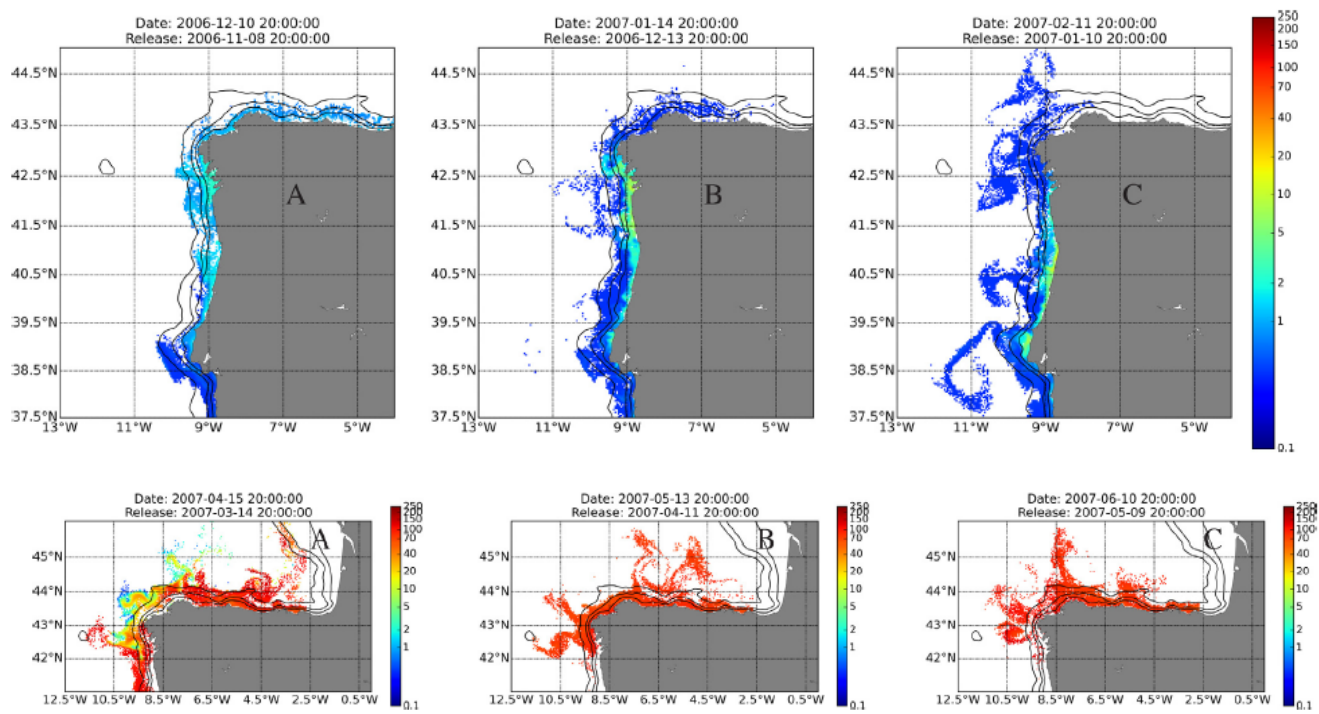
OPEN ACCESS CC BY

Variability of plankton production during the spring bloom in NW Iberia

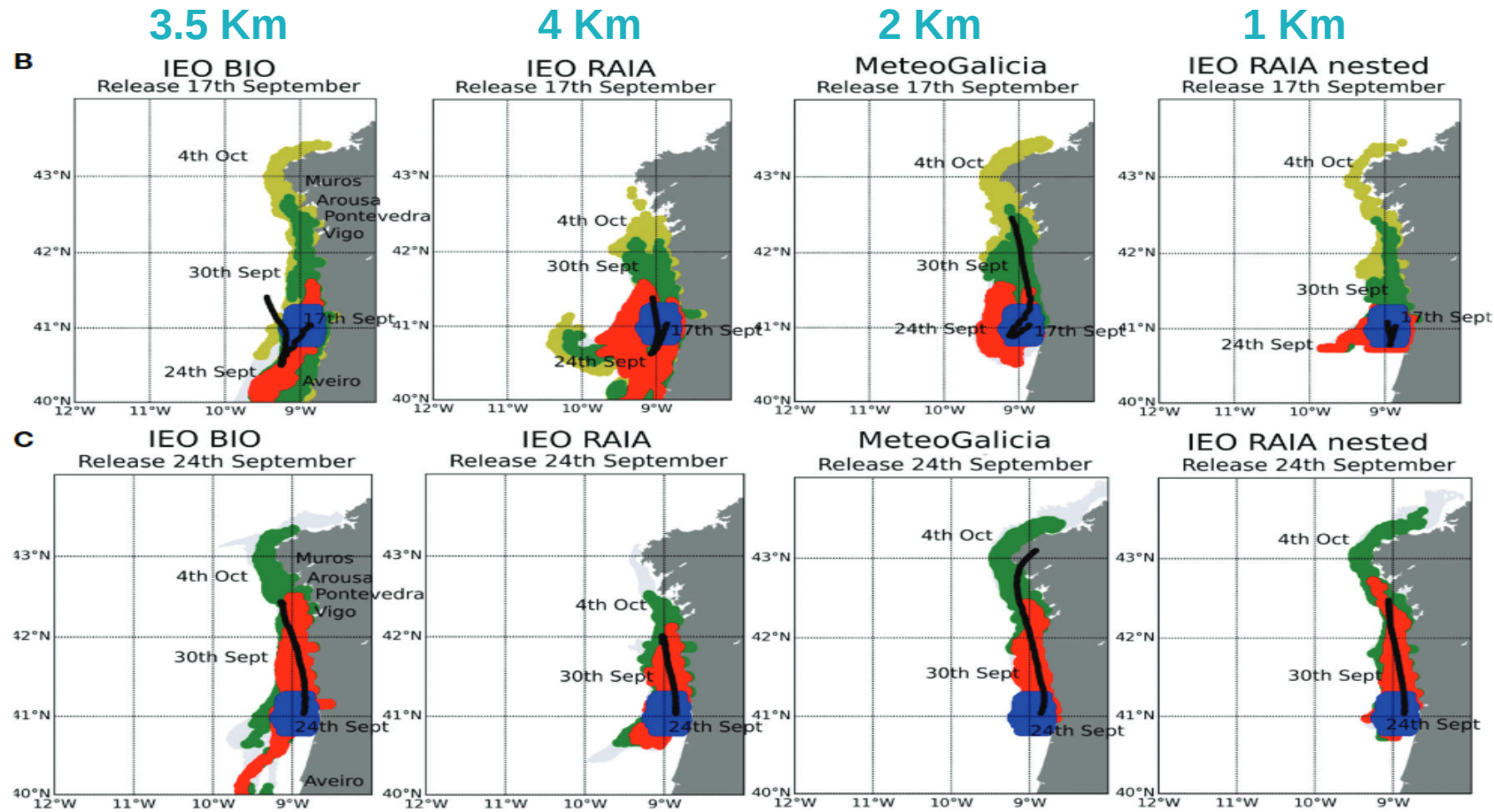
L. M. García-García*, M. Ruiz-Villarreal

Centro Oceanográfico de A Coruña (COAC-IEO), CSIC, 15001 A Coruña, Spain

Temperature and concentration of food of sardine larvae (zooplankton) along particle trajectories



Forzando las simulaciones lagrangianas con distintos modelos oceanográficos



ORIGINAL RESEARCH article

Front. Mar. Sci., 25 July 2022
Sec. Marine Fisheries, Aquaculture and Living Resources
<https://doi.org/10.3389/fmars.2022.749071>

This article is part of the Research Topic
Current Challenges in Providing Early Warning of Harmful Algal and Microbiological Risk to Aquaculture
[View all 13 Articles >](#)

Assessing the Performance and Application of Operational Lagrangian Transport HAB Forecasting Systems

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³ IFREMER, French Research Institute for Exploitation of the Sea, DYNICO PELAGOS, Plouzané, France

Simulación de transporte hacia el norte de *Dinophysis acuta* en otoño 2013
PENDECO proyecto Convocatoria de datos RES

Advección de huevos y larvas de sardina

IEO

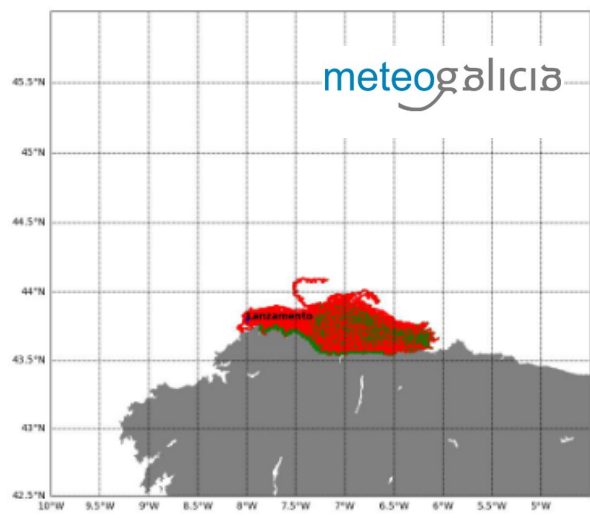
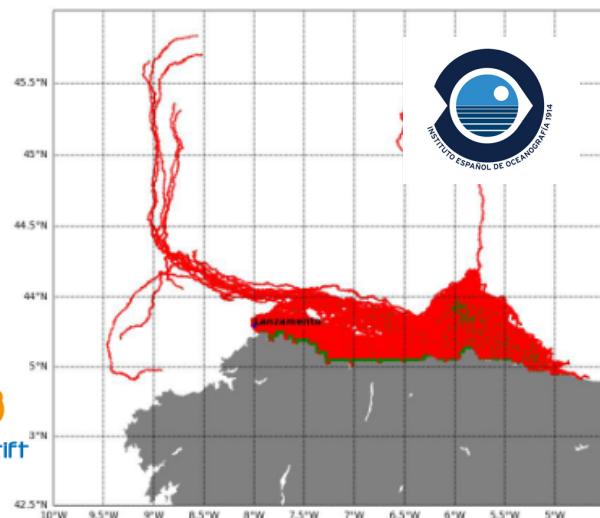
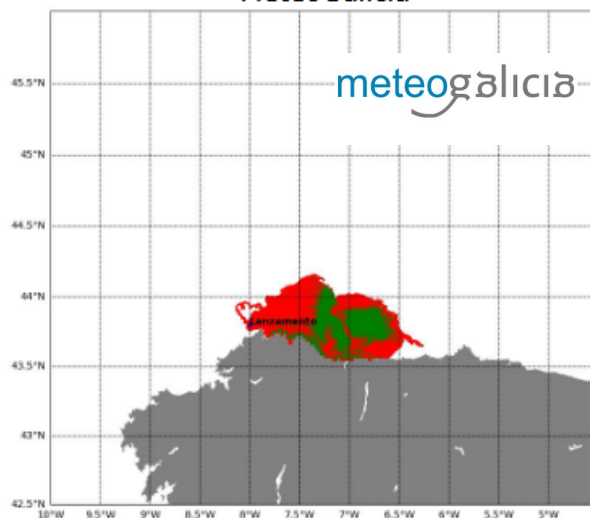
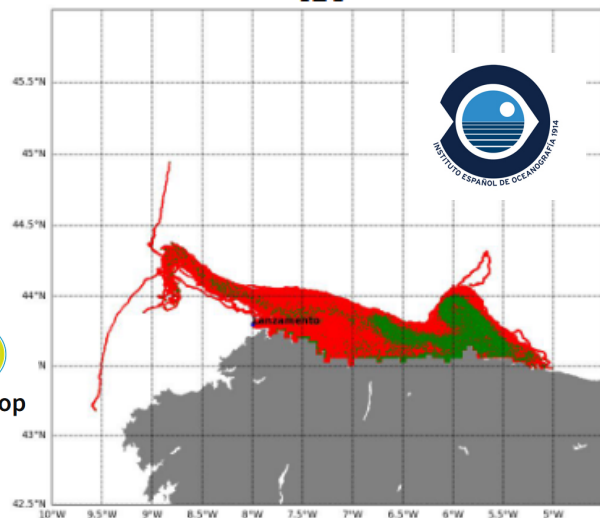
MeteoGalicia

Ichthyop

Ichthyop

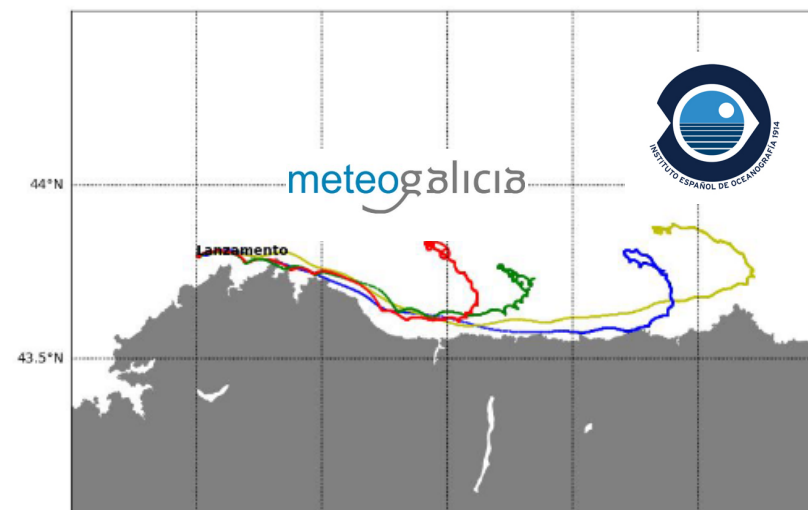
OpenDrift

OpenDrift



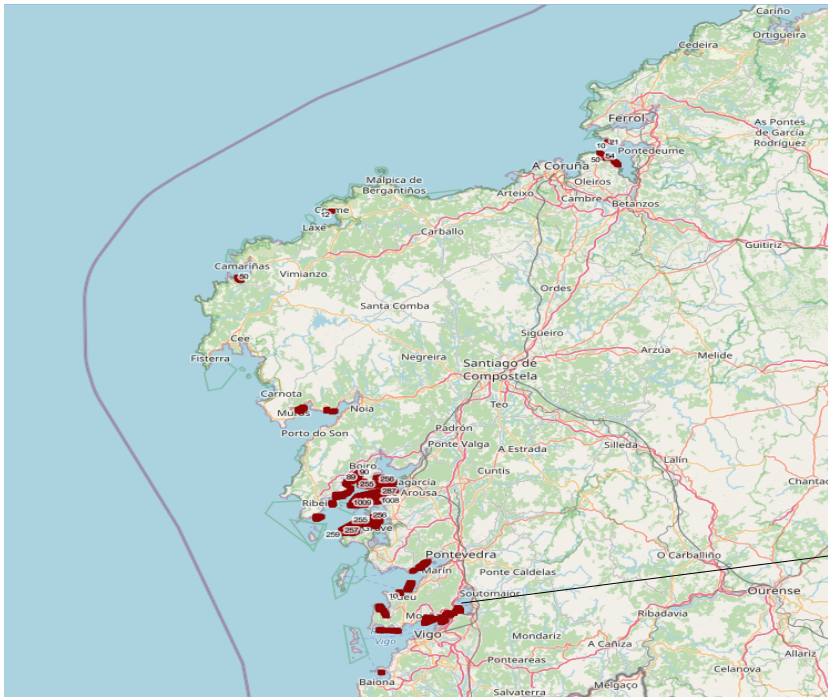
Cantabrian Sea release 1-15 October 2013

Ichthyop - IEO
Ichthyop - MeteoGalicia
OpenDrift - IEO
OpenDrift - MeteoGalicia

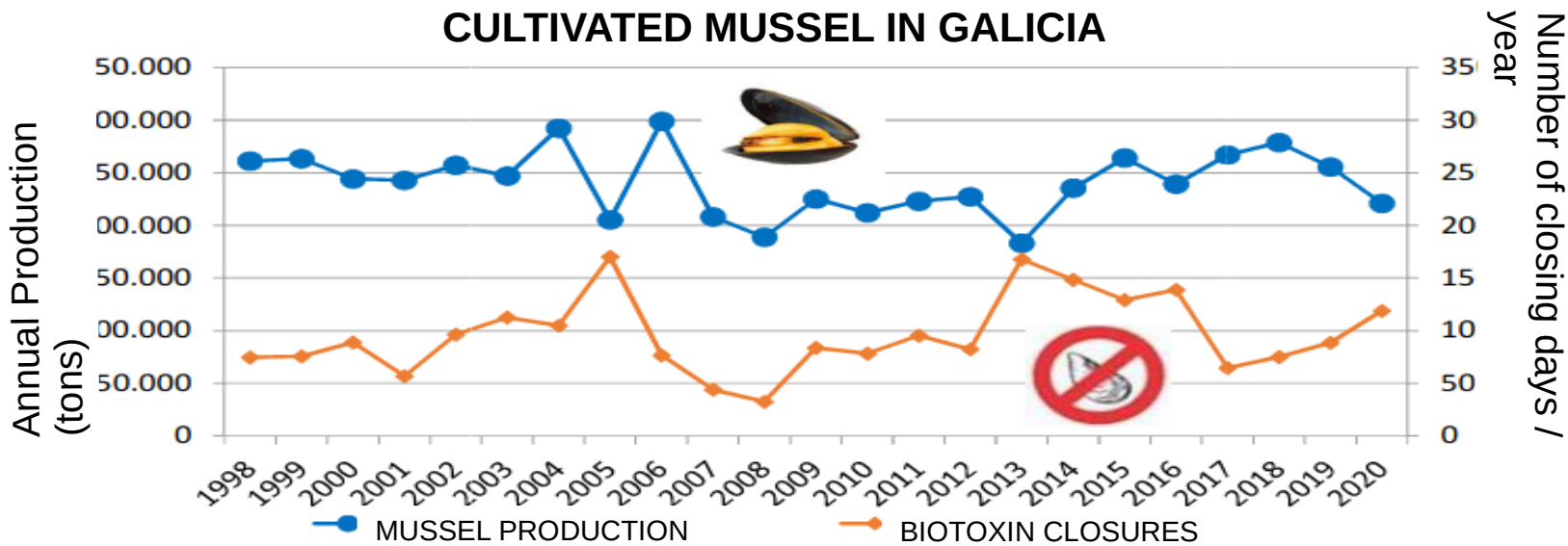


- Longer distances and dispersion with IEO model
- More active particles in Ichthyop (different treatment of coastal interactions)

Simulation	Mean Distance (km)	Positive area (Km2)	Equivalent are (Km2)	Coefficient of Variation	Active particles
Ichthyop/ MeteoGalicia	16.9	4025	227.71	4.08	9292
Ichthyop/IEO	38.73	8625	624.38	3.58	7665
Opendrft MeteoGalicia	26.18	3400	428.38	2.63	1171
Opendrft/IEO	45.09	4175	421.23	2.99	405

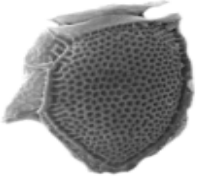
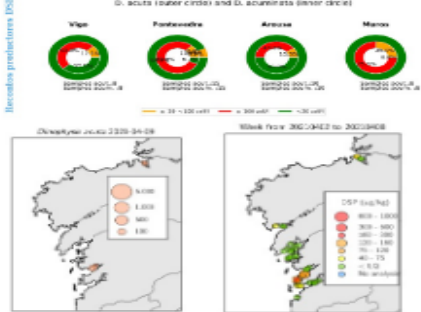


44 harvesting polygons
3387 mussel rafts
Weekly HAB monitoring

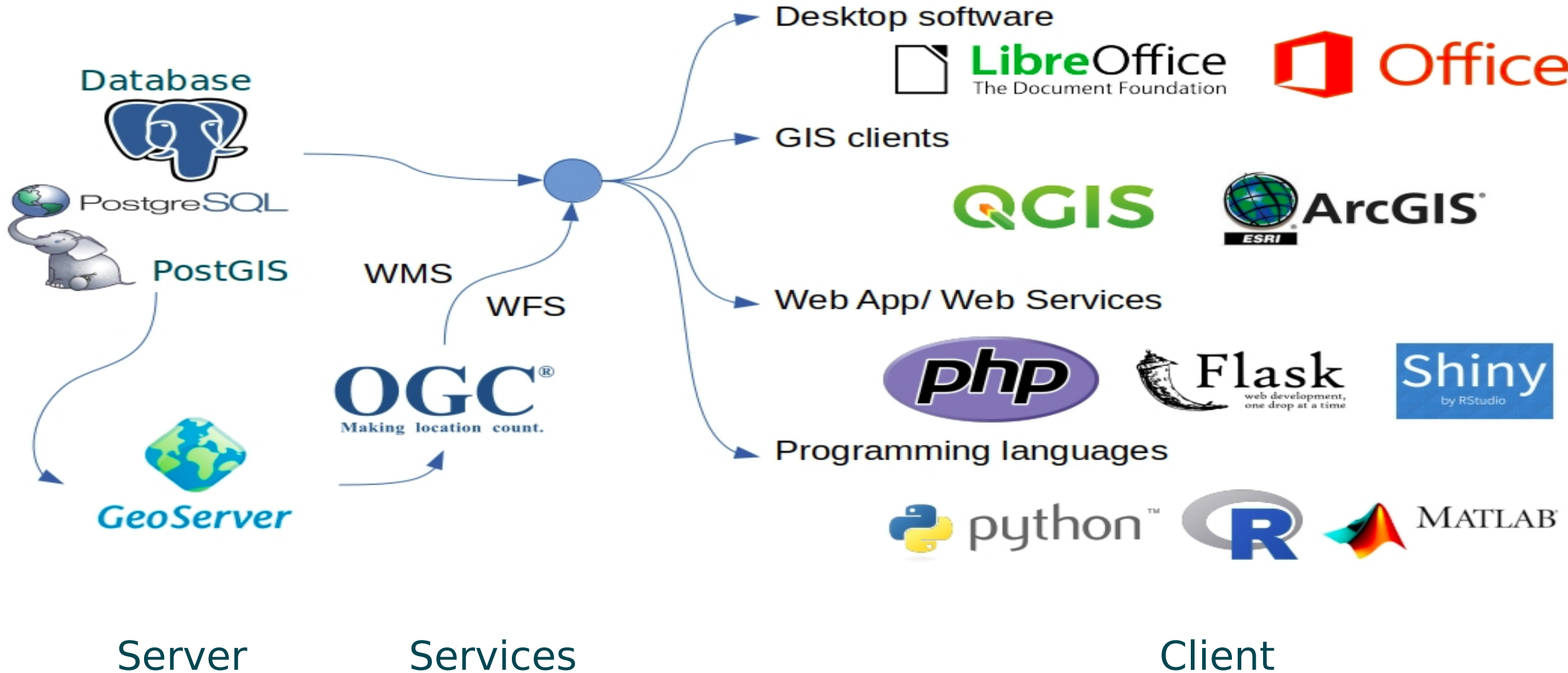


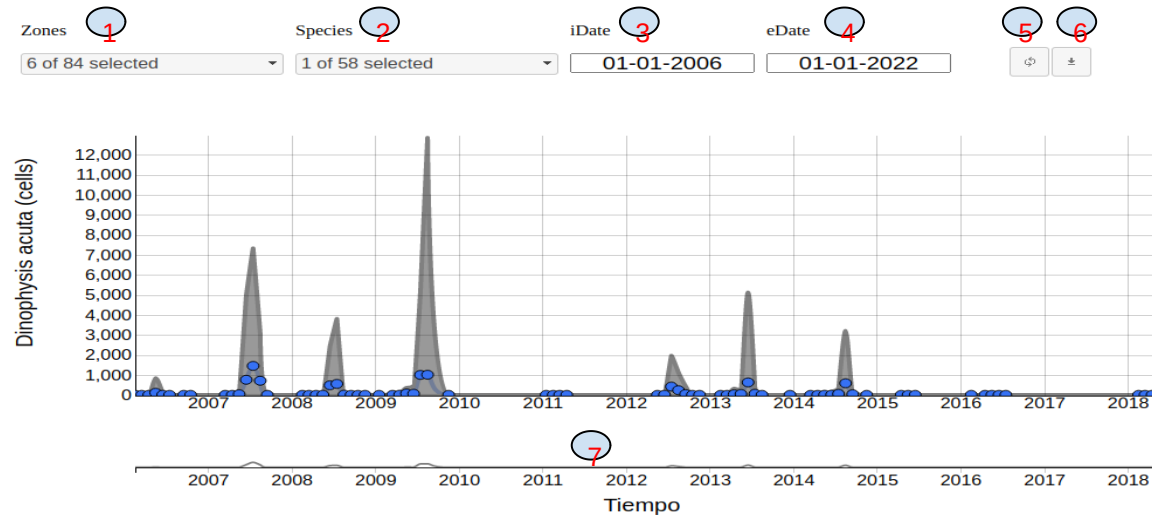
INTECMAR report on closures of mussel polygons 1998-2020, May 2021 (ría do Mar).

Elements of the Galician HAB Early Warning Bulletin

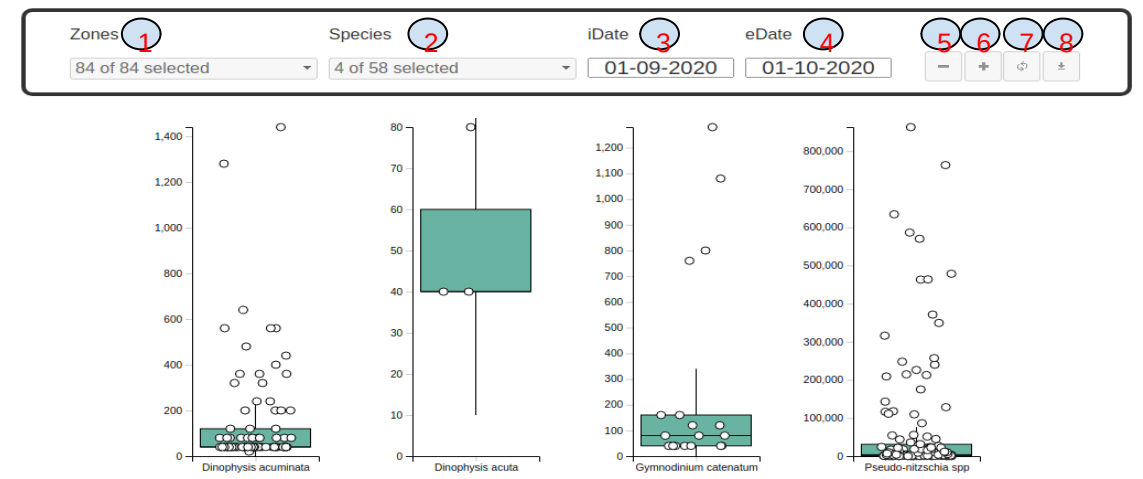
	Data	Sources	Processing	HAB Bulletin
In Situ	 HAB Cells HAB Toxines	 INTECMAR INSTITUTO TECNOLÓGICO PARA O CONTROL DO MEDIO MARINO DE GALICIA	 python™ PostgreSQL	 Mapas de distribución de algas nocivas (DINOFIT) en Galicia (Vigo, Pontevedra, Arousa, Maro). Lenda: 0-100, 100-200, 200-300, 300-400, 400-500, 500-600, 600-700, 700-800, 800-900, 900-1000, 1000-1100, 1100-1200, 1200-1300, 1300-1400, 1400-1500, 1500-1600, 1600-1700, 1700-1800, 1800-1900, 1900-2000, 2000-2100, 2100-2200, 2200-2300, 2300-2400, 2400-2500, 2500-2600, 2600-2700, 2700-2800, 2800-2900, 2900-3000, 3000-3100, 3100-3200, 3200-3300, 3300-3400, 3400-3500, 3500-3600, 3600-3700, 3700-3800, 3800-3900, 3900-4000, 4000-4100, 4100-4200, 4200-4300, 4300-4400, 4400-4500, 4500-4600, 4600-4700, 4700-4800, 4800-4900, 4900-5000, 5000-5100, 5100-5200, 5200-5300, 5300-5400, 5400-5500, 5500-5600, 5600-5700, 5700-5800, 5800-5900, 5900-6000, 6000-6100, 6100-6200, 6200-6300, 6300-6400, 6400-6500, 6500-6600, 6600-6700, 6700-6800, 6800-6900, 6900-7000, 7000-7100, 7100-7200, 7200-7300, 7300-7400, 7400-7500, 7500-7600, 7600-7700, 7700-7800, 7800-7900, 7900-8000, 8000-8100, 8100-8200, 8200-8300, 8300-8400, 8400-8500, 8500-8600, 8600-8700, 8700-8800, 8800-8900, 8900-9000, 9000-9100, 9100-9200, 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In situ Data Processing

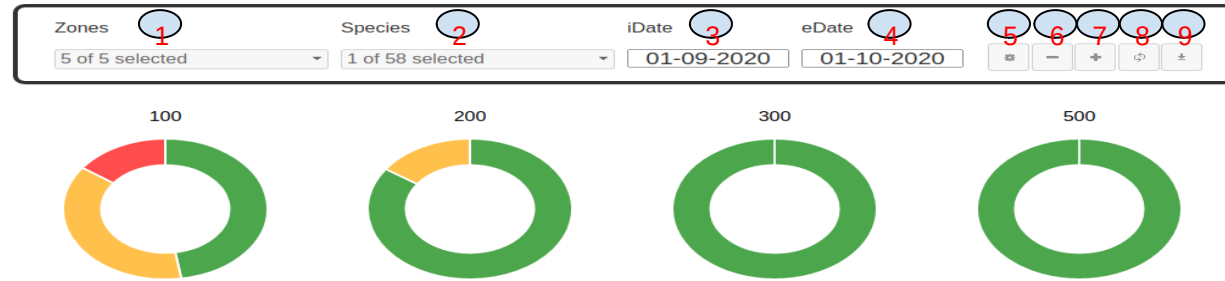




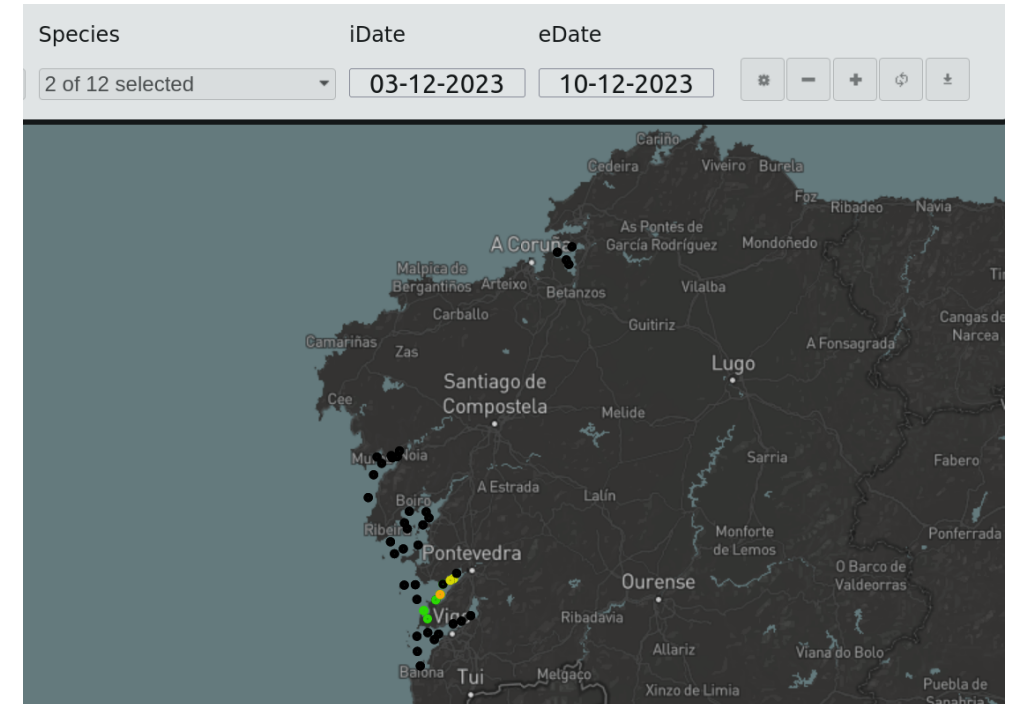
Series temporales



Especies tóxicas



Estado de zonas



Plataforma Integrada Datos Mariños de Galicia: Resultados esperados

O desenvolvemento desta plataforma integrada de datos supón unha serie de retos tecnolóxicos importantes:

- 1) a integración de fontes de datos heteroxéneas: observación, modelado, series continuas, ocasionais, móbiles, imaxes tomadas con diferentes cadencias (dez minutos, horarias, diarias, mensuais)
- 2) a procura e exploración interactiva sobre os datos masivos e heteroxéneos,
- 3) a integración de procesos de computación e almacenamento nunha única plataforma
- 4) o establecemento de rutinas de control de calidade e interconsistencia.

Oportunidade para explorar diferentes fontes de datos, estudar o seu nivel de estandarización e acadar finalmente a integración nunha **plataforma única**.



Características

El Poder De Los Datos

Nuestra plataforma BigData permite a los usuarios desarrollar sus propios códigos de análisis y ejecutar tareas lanzando notebooks de Jupyter.



Acceso a datos científicos

Acceso a conjuntos de datos científicos marinos para su exploración y análisis.



Notebooks personalizados

No pierdas tu trabajo. Crea y guarda tus propios notebooks de Jupyter.



Infraestructura sólida

Utiliza una Infraestructura robusta que garantiza un rendimiento óptimo y fluido.



Análisis avanzado de datos

Realiza análisis profundos de los conjuntos de datos científicos disponibles.

Sobre nosotros

Nuestra infraestructura

El programa CCMM utiliza la plataforma [BigData](#) del CESGA. Proporciona un acceso rápido a soluciones de Big Data 'ready-to-use' y permite a los usuarios aprovechar las modernas herramientas para el tratamiento de datos, cubriendo una amplia gama de casos de uso que incluyen el procesamiento de grandes volúmenes de información de forma paralela, procesamiento a alta velocidad de flujos de datos en tiempo real, o el procesamiento de datos heterogéneos de distintas fuentes (estructurados y no estructurados). No es necesario aprender a desplegar complejos servicios de Big Data, los usuarios sólo tienen que conectarse y empezar a utilizarlos. BDICESGA proporciona una infraestructura escalable cuya capacidad puede crecer con la demanda añadiendo recursos adicionales. Actualmente proporciona:

- ✓ Almacenamiento: 2.5PB
- ✓ Rendimiento E/S: 30GB/s
- ✓ Memoria RAM: 2.432TB
- ✓ 912 Vcores
- ✓ 10GbE de conectividad entre nodos

[Descubrir más](#)



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Grazas!



EPB, MERVEX

OCEANOLOXÍA

