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ACTION B2

Final SDI development report (LIFE13 ENV/ES/000131)

Version Last updated on Author Responsible Involved partners Final June 2018 CESGA CESGA IEO, IIM-CSIC













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1. Introduction

This document describes the results obtained within Action B2 "*Development of a fish discards SDI*" aimed at achieving the main objective of the iSEAS project: the development and implementation of an efficient and comprehensive discard management network through the improvement of the implementation of both existing knowledge and innovative solutions, involving all stakeholders present in the fishing sector (fleets, ports, markets, industries, etc ...) and whose results are to minimize discards in addition to its optimal valorization to recover and produce chemicals of interest to the food and pharmaceutical industries.

With this objective, a Spatial Data Infrastructure (SDI) has been implemented, complying with the INSPIRE 2007/2 Directive, which allows access to geoservices specifically related to fishing discards. This infrastructure has the standard services of the OGC Web Map, Web Feature, Web Coverage, Web Processing and Catalog, and is based on a data model and its corresponding database that has been developed with the other project partners.

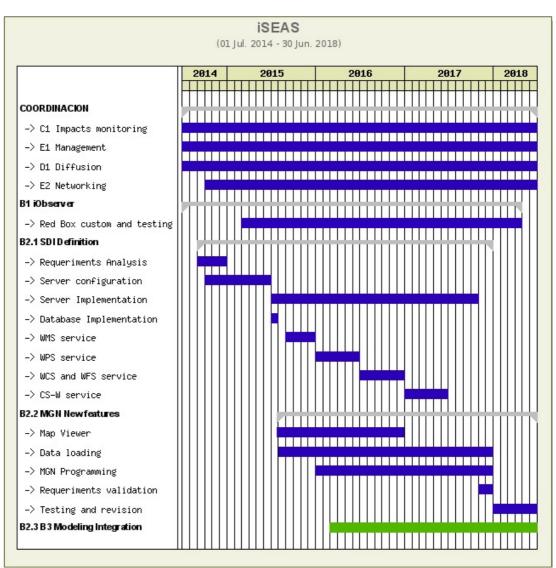
A RedBox tool has been created for the acquisition of catch information, within task B1 of implementation of new on-board technologies, and in coordination with the iObserver species identification system, which stores the data in real time and transmits it to the data server on the ground, housed in the CESGA.

An online Geoportal has also been developed with a map viewer to be able to consult all information of catches and species valorization. It also includes spatial and temporal maps based on spatial temporal models developed in task B3 for the activity of the selected fleets (considering the distribution of the species), giving fishermen the opportunity to avoid areas or periods with an abundance of unwanted catches and also contribute to obtain the most profitable, ecological and fuel-efficient catches, complying with the European Commission's policies regarding environmental protection.









Task breakdown







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2. Model and database

2.1. Data Model

The database is stored in a PostgreSQL database server system, version 9.2.17 with the PostGIS spatial data extension, version 2.1.8-1. The data model has been refined from the initial model included in the requirements specification document.

There are four access levels with their corresponding permissions to serve the information, both in the Geoportal and in the SDI services:

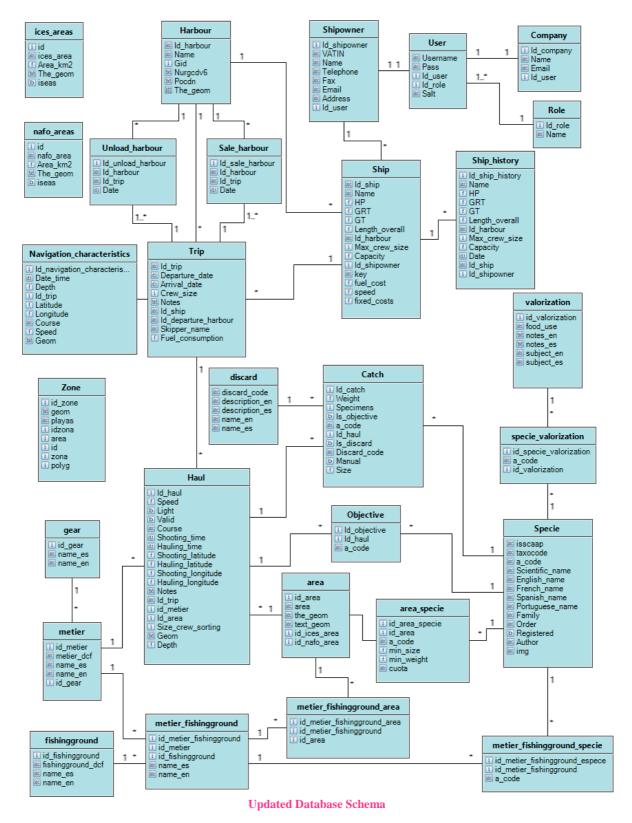
- Administrator (0): Has full access. It is a user who is responsible for maintenance of the system.
- Privileged access (1): Has access to read all data, services, reports and generated maps. It will be used by the research partners of the project.
- Data Introducer (2): In addition to access to basic data, has permission to enter fishing data and access its own. It is composed of the operators on board the fleets and the Observer and owners.
- Limited access (3): Access to basic data (ports, valuations, maps ...) and the results of the models. General public.

In collaboration with the IEO, the concept of metier and its relationship with fishing grounds, fishing areas, target species and gears is included in the data model. This is used to categorize catches and to feed the fishing suitability models of action B3. The operator selects the metier for each haul and from this and the GPS position the system automatically determines fishing area, fishing grounds, target species and used gear.





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Three main categories are defined to classify the catches that include the landing obligation and their marketability from a point of view conditioned by regulations:



- Marketable retained: sale for direct human consumption, whether usual catches or new catches that can be landed within the framework of the landing obligation.
- Retained not marketable: with landing obligation and aimed to other valorizations.
- Discarded: capture with no landing obligation, returned to the sea.

From an economic point of view, catches are classified in two categories:

- Wanted: only the retained marketable catch of commercial interest.
- Unwanted: retained marketable catch but of insufficient commercial value, retained not marketable and discarded catch.

The system is designed to work with time data in Coordinated Universal Time (UTC) format.

2.2. Relevant entities

The project involves 23 different species plus a special case "Other" in which the rest of the captured species are classified.

A_code	Scientific	Spanish	English
000	Other	Otra	Other
ANK	Lophius budegassa	Rape negro	Blackbellied angler
ARU	Argentina silus	Tomasa	Greater argentine
BOC	Capros aper	Ochavo	Boarfish
COD	Gadus morhua	Bacalao del Atlántico	Atlantic cod
CQL	Coelorinchus caelorhincus	Granadero acorazado	Hollowsnout grenadier
DAB	Limanda limanda	Limanda	Common dab
GHL	Reinhardtius	Fletán negro	Greenland halibut
GUR	Aspitrigla cuculus	Rubio	Red gurnard
HKE	Merluccius merluccius	Merluza europea	European hake
HOM	Trachurus trachurus	Jurel	Atlantic horse mackerel
LDB	Lepidorhombus boscii	Gallo de cuatro	Four-spot megrim
MAC	Scomber scombrus	Caballa del Atlántico	Atlantic mackerel
MEG	Lepidorhombus	Gallo del Norte	Megrim
MON	Lophius piscatorius	Rape blanco	Angler(=Monk)
PLA	Hippoglossoides	Platija americana	Amer. plaice(=Long rough
RED	Sebastes spp.	Gallinetas del	Atlantic redfishes nei
RHG	Macrourus berglax	Granadero berglax	Roughhead grenadier
RJC	Raja clavata	Raya de clavos	Thornback ray











RJN	Leucoraja naevus	Raya santiguesa	Cuckoo ray
RJR	Raja radiata	Raya radiante	Starry ray
SYC	Scyliorhinus canicula	Pintarroja	Small-spotted catshark
WHB	Micromesistius poutassou	Bacaladilla	Blue whiting(=Poutassou)
WIT	Glyptocephalus cynoglossus	Mendo	Witch flounder
		TOTAL CLASSICS	

iSEAS Species

The database includes the valorization data that is associated with each of the species for which it is relevant.

The reasons for discarding are defined according to the observer protocol of the IEO. These discard reasons apply to the unwanted catch and, therefore, are considered as reasons for non-desirability.

- CAC1: The species composition affect the exercise of discarding (high amounts of unwanted species restrict the selection)
- CAC2: Size composition (high rates of fish in small categories can interfere in the selection of sizes)
- CAC3: Total number captured (high total catches affect the selection)
- CAP1: The available space in the holds may affect the practice of discarding (if space is at a premium only retain high-value species or category)
- DAM1: Damaged specimens
- MAR1: No market in the port of landing
- MLS1: Undersized
- NAL1: Not allowed
- QAL1: In the long trips species are preserved worst may be discarded at the beginning and be retained in the last days
- QUO1: Excess of quota
- TIM1: By quota restrictions only retain high value species
- VAL1: Due to time constraints only retain high-priced categories
- WEA1: Poor housing conditions affect the selection

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The database incorporates data with quotas at the country level for each species as well as minimum sizes. The system automatically classifies catches as marketable or not taking into account the availability of quota for the specific species and if it exceeds the minimum size.

2.3. Fishing data

CSIC CESCA

The database incorporates fishing data from commercial vessels of Opromar with an observer from the IIM between 2014 and 2018.

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	Trips	Sampled Hauls	Wanted (kg)	Unwanted (kg)	Total (kg)
Atardecer	2	8	3110	6389	9499
Ensenada de Bueu	2	10	3324	2946	6269
Gonzacove Dos	5	63	10416	25882	36298
Gonzacove Uno	3	26	4182	23806	27989
Hermanos Soage	1	5	1771	12279	14050
Nuevo San Cibrán	19	78	22056	37239	59295
Pescarosa Cuarto	1	2	7142	128	7269
Playa do Castro	3	8	6476	724	7200
Portosanto	11	275	63762	171252	235014
Ría de Marín	18	80	30150	44083	74233
	65	555	152389	324728	477116

IIM Fishing data summary









3. Web Service

The web service provides the RedBox application with access to the database for the synchronization of fishing data.

The web service implements a secure connection mechanism by Secure Sockets Layer (SSL) protocol between the RedBox and the web service at CESGA. Each ship have a unique key to ensure the transmission of catch data.

The performance of the web service has been optimized in terms of data volume to adapt to the greater requirements of the geographic data layers of the Areas entity.









4. RedBox

4.1. General scheme

The main task of the RedBox application is to record and manage the fishing data generated by a ship during the trip, based on the data entered by the operator and those generated by the artificial vision species recognition system IObserver and contextualize the catch information relating it to the Trip and the Haul.

The application connects to different ship navigation instruments and collects position, heading, speed and depth information at regular intervals.

It also provides a simple user interface that allows the operator to view and modify the information before being sent via satellite to the iSEAS project server at CESGA.

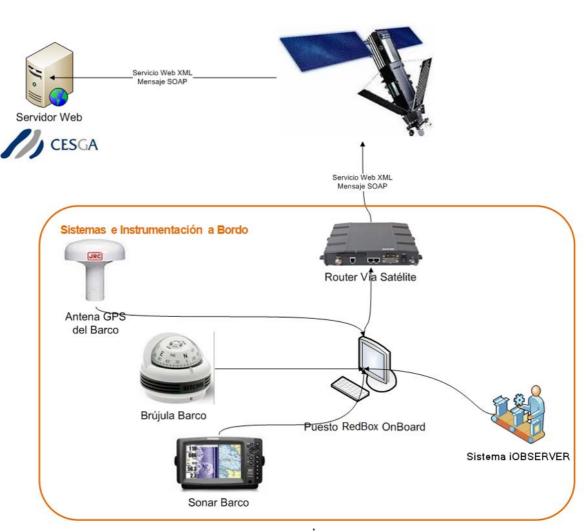
The following diagram presents an overview of the Red Box system within the general scheme of the iSEAS project:











Integration of RedBox in the general architecture of the system

The RedBox software will be installed on a PC, typically located on the ship's bridge. The software has been designed so that the technical requirements of the computer on which it is installed remain low.

A connection, typically by serial cable, allows the acquisition of data in NMEA format generated by onboard instruments. The application is configurable to be able to adapt to the existing connection type and to work with different instrumentation equipment.

The data coming from the iObserver system is received through a network connection.

If the ship has satellite equipment for data transmission, it can also be connected to the RedBox. If there is no satellite router available, a cellular network router with WiFi connection can be used to carry out transmissions in coverage areas near the coast.

In a typical trip, the software will be operational as long as the trip lasts or, at least, during the time the ship is in the fishing zone. This is so that the software can collect the GPS position data at any time and then automatically locate the hauls when the operator records them.

The RedBox is based on the .NET Framework 4.0 work environment and the Entity Framework 6 data access API to enable the use of geographic data.



The application is available in English and Spanish and its functionality is detailed in two manuals in both languages.

It has an installation program for the application to facilitate its installation on board.

4.2. Main functionalities

4.2.1. Trip

It allows to enter the general data of the trip as the date of beginning and end of the trip, departure harbour, crew, sale and unload harbours, etc.

While the trip remains open, all data relating to this trip can be modified and synchronized with the central server. Once closed and synchronized it can no longer be synchronized in order to maintain consistency with the data hosted on the central server.







😨 iSEAS RedBox - [Opened Trip	- BOVE-01_180606003]	L		_		×
Contraction Contractica Con	80606003				-	₽×
Opened Trip Opened Trip Start New Trip View / Edit Opened Trip Finish Trip Opened Trip Hauls Opened Trip Summary	Accept Ca General Departure Date Departure Harbour Crew Size	ncel miércoles 06/06/2018 12:33 ESVGO Vigo 35 🖨		, UTC		
🚺 Map 💭 Regir. iObserver Catch	Skipper Name Notes					
Master Data Master Data Ship Data Finished Trips Finished Hauls Settings Synchronize Data Observer Sync Mavigation Char. Monitor	Unload Harbours	ESMRS - Muros	Sale Harbours	ESMRS - Muros ESCCN - Corcubión		
About About Status: System RedBox	ready	Open Trip screen	•	÷		-

4.2.2. Hauls

Hauls are the main entity in the application and, in an environment in which catch data is supplied by the iObserver system, those that require greater attention by the operator. For this reason data entry is optimized and automated to the maximum; in a typical haul the user will only have to enter the shooting and hauling times, the rest of the fields are automatically filled:

- The navigation data is obtained from the navigation instruments recorded data.
- The fishing area for a haul in RedBox is calculated from the geographical coordinates of the shooting point.
- The metier is recovered from the one registered in previous hauls. The metier will also serve to determine other data such as fishing grounds or fishing gear used.
- The selection of target species is obtained from the selected haul area and metier.
- The calculation of light conditions is made based on the geographical position and the shooting and hauling times of the haul.

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• The calculation of the speed is estimated at the midpoint of the haul.

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All this information can be entered manually, yet the system makes the necessary checks to ensure the validity of the data.

							-		×
Hauls Trip BOVE-01_180	60600	3							- 8 :
🖃 🥘 Opened Trip								+	= 4
···· 🚍 Start New Trip ···· <mark>冒 View / Edit</mark>	ld Haul	Sampled	Shooting Time UTC	Hauling Time UTC	Wanted (Kg)	Unwanted Retained (Kg)	Discarded (Kg)	Ĩ	
🎦 Finish Trip	10250		06/06/2018 8:35:56	06/06/2018 9:36:23	0	0		0	
🝎 Hauls	10251		06/06/2018 10:36:33	06/06/2018 11:36:33	0	0		0	
- 📶 Summary	10252	\checkmark	06/06/2018 12:36:46		0	0		0	
🚺 Мар									
Reglr. iObserver Catch									
-2									
🕀 🔛 Master Data									
🛞 Ship Data									
🟹 Finished Trips									
🟹 Finished Hauls									
🔧 Settings									
与 Synchronize Data									
···· 🚮 iObserver Sync									
🚺 Navigation Char. Monitor									
About									
-									
Status: System RedBox	ready		Hauls s						

Hauls screen



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🛜 iSEAS RedBox - [Opened Hau	I - 10250]	-		×
Trip BOVE-01_1806060	03 🕨 Editing Ha	ul 10250	-	8 ×
🖃 🥝 Opened Trip	🛹 Accept 🛛 🔀 C	ancel		
📰 Start New Trip	General Catches			
🔚 View / Edit	Sampled			
🎦 Finish Trip	Shooting Time	miércoles 06/06/2018 08:35 🛛 🖉 UTC Light 🗹		
Hauls	Shooting Latitude	42.41534611 🖨 N Longitude -9.18457031 🖨 W		
💷 Summary 🚺 Map	Hauling Time	✓ miércoles 06/06/2018 09:36		
Reglr. iObserver Catch	Hauling Latitude	N Longitude E		
	Speed	Knt Course		
🖽 🗭 Master Data	Metier	OTB_MPD_>=55_0_0 OTB_MPD_>=55_0_0		
🛞 Ship Data	Notes			1
🖂 Finished Trips				
🟹 Finished Hauls				
🔧 Settings	Objectives	HOM Trachurus trachurus Atlantic horse mackerel		
- 与 Synchronize Data		MAC Scomber scombrus Atlantic mackerel		
- 🚮 iObserver Sync		ANK Lophius budegassa Blackbellied angler		
- 🚺 Navigation Char. Monitor				
i About		+		
I Status: System RedBox	, ready			.:

4.2.3. Catch

Catches can be edited manually or captured automatically from the data provided by the iObserver system. The main recorded data are: species, average size of the lot, weight of the lot and, in case of being unwanted, reason for being unwanted and if it is discarded or retained.



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📮 iSEAS RedBox - [Opened Hau	ıl - 10250]								-		×
Trip BOVE-01_1806060	03 🕨 Ec	liting Haul 1025	0							-	₽×
🖃 🧐 Opened Trip	Acce	pt 🛛 🔀 Cancel								+•	- 2
📰 Start New Trip	General	Catches									
🔚 View / Edit	A Code	Specie Name	Avg Size	Weight Caught	Unwanted	ls	ls	Manual			
- 🎦 Finish Trip			(cm)	(Kg)		Discard	Objective				
- 📶 Hauls	BOC	Boarfish	8	3							
- 🕕 Summary	HKE	European hake	9	6	MLS1			\checkmark			
📐 Map											
🛄 🔛 Reglr. iObserver Catch											
	1										
⊕ 🧭 Master Data											
🐨 🛞 Ship Data											
- Tinished Trips											
🯹 Finished Hauls											
Godings											
Synchronize Data											
iObserver Sync											
Navigation Char. Monitor											
🛄 About											
I Status: System RedBox	ready										:
	-		Catch	es screen							







😨 iSEAS RedBox - [Catch]					-		×
ե Trip BOVE-01_1806060	03 🕨 Haul 10250	Editing Catch 11	135			-	đΧ
Opened Trip Start New Trip Start New Trip View / Edit Hauls Map Keglr. iObserver Catch	Accept Can Specie Avg. Size Unwanted Reason Discarded Is Objective Manual	HKE - European hake P Cm MLS1 - Undersized	Weight Caught	✓ Q 6.000 ÷	Kg		
Master Data Master Data Ship Data Ship Data Master Data Ship Data Master Data							
Status: System RedBox	ready						:
		Edit Catch scre	en				

4.2.4. Summary and Trip Map

CSIC CESCA

To provide the operator with the visualization of the data, a summary screen of the catches is available and another one that shows the hauls for the open trip on a map.

The summary screen of the catches for the open trip shows catch data grouped by species and totalizing wanted catch weight, retained unwanted catch and discarded unwanted catch.

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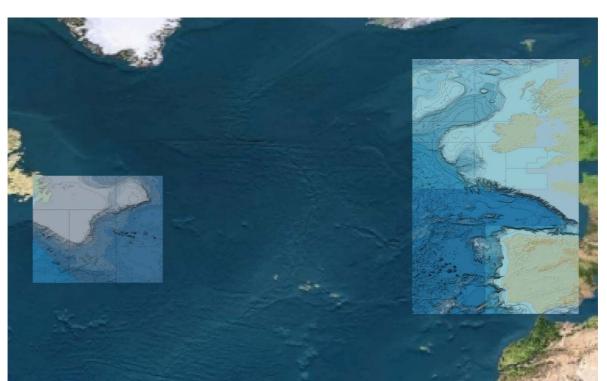
SEAS

iSEAS RedBox - [Summary]						-	- 🗆	×
Trip Summary								- 8
Opened Trip Start New Trip View / Edit Finish Trip Hauls		Dep	parture Date miéro	VE-01_180606 coles 06/06/20 ure Harbour V)18	00:33:13 UTC		
1 Summary	A Code	Specie Name	Wanted (Kg)	Unwanted Retained (Kg)		Discarded (Kg)	Total (Kg)	
Map	ANK	Blackbellied angler	4.000		0	0		4.00
Reglr. iObserver Catch	BOC	Boarfish	3		0	0		
	DAB	Common dab	0		0	16.000		16.00
	HKE	European hake	0		6	0		
🗈 🗭 Master Data	I <u></u>			-				
···· 🛞 Ship Data	TOTAL		7.000		6	16.000		29.00
📆 Finished Trips								
📆 Finished Hauls								
🔧 Settings								
···· 式 iObserver Sync								
Navigation Char. Monitor								
About								
Status: System RedBox								

Trip Summary screen

The map screen shows the data of the active trip in real time on a georeferenced map. From the bathymetry "General Bathymetric Chart of the Oceans (GEBCO)", with a resolution of 30", a hillshade map with isobats every 200 meters was rendered for the fishing areas with which the project works in order to use it as background layer.





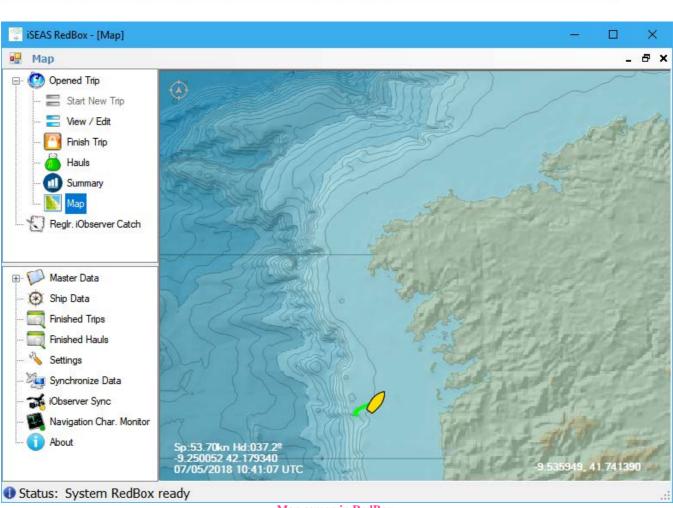
GEBCO bathymetry rendered areas







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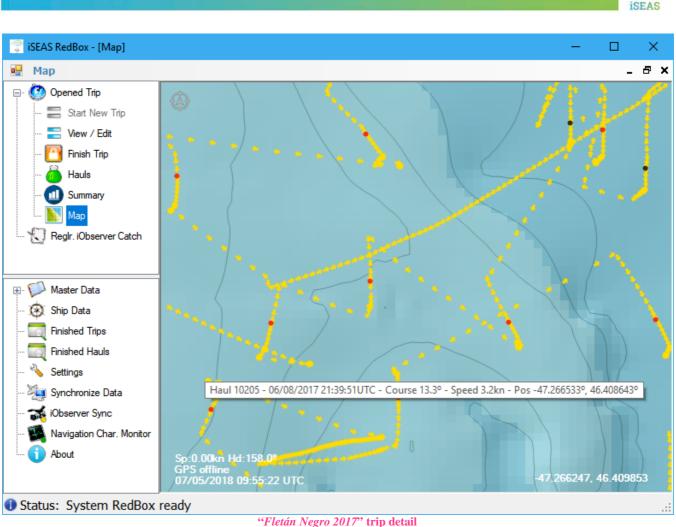


Map screen in RedBox

Every 5 seconds the ship's navigation data is updated on the map. The yellow arrows show the position and heading of the ship at periodic intervals, typically between 1 and 5 minutes. The red points show the shooting positions of a haul. Black points are hauls not sampled. Passing the mouse over the navigation or haul points, a popup appears with the associated information. Clicking on a haul opens the corresponding screen of the haul.



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Freum Negro 2017 Trip ucta

4.2.5. iObserver catches regularization

CSIC CESCA

The RedBox software periodically analyzes and stores in its database the catch data recorded in the files that come from the iObserver system as it processes the fishes that pass through the conveyor belt.

The "Regularize iObserver Catch" screen displays the catch data that has arrived from this system and that has not yet been assigned to the hauls so that the operator can review them.

Once reviewed, the operator can instruct the application to assign the captures to the hauls calculated from the time stamp of the camera and the periods defined by the shooting and hauling times of the hauls recorded in RedBox. For each haul, the catch data will be grouped in batches according to the species, on the one hand the desired catches and on the other the unwanted catches, and according to the motive of non-desirability.

There is the possibility that the regularization is carried out automatically without the need for intervention by the operator.

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1	
1. The	
and the	
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Regularize iObserver Cat	chs							- 8
Opened Trip	Refresh				Assign	to Hauls 🤿	Mark as Not	
Start New Trip	Classification Date UTC	Haul	A Code	Specie Name	Size (cm)	Weight (Kg)	Accuracy	Т
View / Edit	15/06/2017 8:23:59		НОМ	Atlantic horse mackerel	11.100		MEDIO	
- 🎦 Finish Trip	15/06/2017 8:24:05		000	Other	16.500	24.982	ALTO	
- 🚠 Hauls	15/06/2017 8:24:11		MEG	Megrim	71.500	599.008	ALTO	
Summary	15/06/2017 8:24:11		WHB	Blue whiting(=Poutassou)	69.100	600.943	ALTO	
	15/06/2017 8:24:18		HKE	European hake	73.600	441.083	MEDIO	
	15/06/2017 8:24:18		HKE	European hake	83.200	498.616	MEDIO	
K Reglr. iObserver Catch	15/06/2017 8:24:18		НОМ	Atlantic horse mackerel	46.300	102.452	ALTO	
	15/06/2017 8:24:18		000	Other	30.200	0.000	BAJO	
-2	15/06/2017 8:24:18		НОМ	Atlantic horse mackerel	47.800	105.771	ALTO	
🤛 Master Data	15/06/2017 8:24:18		HKE	European hake	67.600	405.125	MEDIO	
🛞 Ship Data	15/06/2017 8:24:28		MEG	Megrim	93.400	782.481	ALTO	
[] Finished Trips	15/06/2017 8:24:28		HOM	Atlantic horse mackerel	53.700	118.826	ALTO	
Finished Hauls	15/06/2017 8:24:28		HKE	European hake	43.600	261.294	MEDIO	
Settings	15/06/2017 8:24:36		SYC	Small-spotted catshark	94.500	1464.277	ALTO	
20	15/06/2017 8:24:36		WHB	Blue whiting(=Poutassou)	89.500	778.356	ALTO	
Synchronize Data	15/06/2017 8:24:36		000	Other	58.900	89.178	ALTO	
😽 iObserver Sync	15/06/2017 8:24:44		000	Other	41.800	63.287	ALTO	
Navigation Char. Monitor	15/06/2017 8:24:44		000	Other	74.500	112.797	ALTO	
About	15/06/2017 8:24:50		000	Other	74.500	112.797	MEDIO	
•	15/06/2017 8:24:50		HKE	European hake	67.000	401.529	BAJO	
	15/06/2017 8:24:50		WHB	Blue whiting(=Poutassou)	69.200	601.813	MEDIO	

Regularize iObserver Catch screen







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🜍 iSEAS RedBox - [iOberver Cate	:h]	- C	ı x
🖕 Regularize iObserver Cat	chs 🕨 Editing iObserv	er Catch 154504	- 8 ×
Opened Trip Start New Trip Start New Trip Wew / Edit Finish Trip Hauls Summary Map Regir. iObserver Catch	Accept Cancel No Classification Date A Code Size Accuracy File Name	5 15/06/2017 08:24:18	
Master Data Ship Data Ship Data Finished Trips Finished Hauls Settings Synchronize Data iObserver Sync Navigation Char. Monitor About	Stream Notes	5;20170615082418;HKE;736;441083;MEDIO	
Status: System RedBox I	-	server Catch Edit screen	

4.2.6. Data synchronization

It allows the user to see and perform the pending synchronizations with the central system as well as to download the master data.

The software synchronizes fishing data with the central iSEAS server through a web service that provides access to the project database.

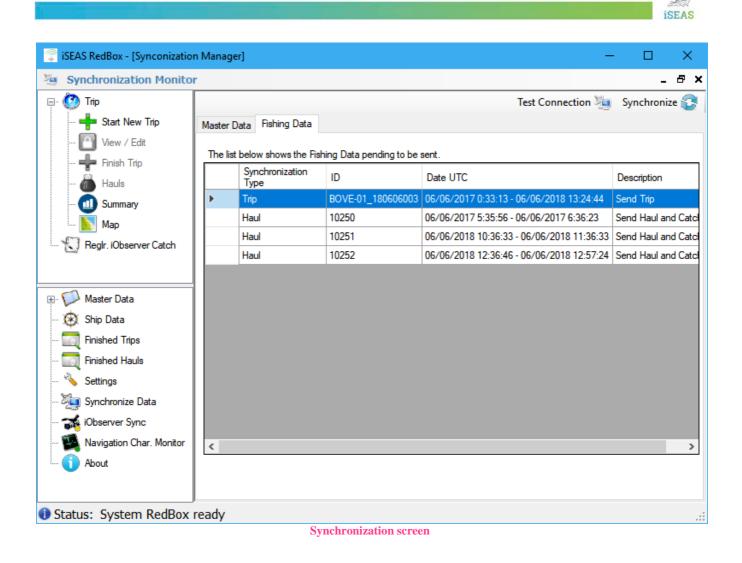
While the current trip is not closing, the information already synchronized with the server can be updated.





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4.2.7. Other functionalities

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In addition to those already mentioned, the application offers various features such as:

- Master Data: The master data includes all the information that is downloaded from the central system and stored in the local database of the application. It is data that RedBox uses to simplify the usability of the system and help the user in recording data. There are 8 categories: Gears, areas, species, ports, areas-species, unwanted reasons, metiers and fishing grounds.
- Ship data: allows to establish the name of the ship and its main characteristics as well as to review the history of changes.
- Finished trip and hauls data: allows the operator to search for completed trips and hauls stored in the local database and access all the data related to them.
- Settings: it presents several configuration parameters related to the operation of the application and allows its modification.
- iObserver synchronization service: allows the user to check the status of the synchronization service with the iObserver system.
- Navigation characteristics monitor: allows checking the status of the ship's instruments navigation data capture service and displays a list of the latest recorded navigation data.

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Information screen about the application.

iSEAS RedBox - [Area Species	List]						—		×
Area Specie List								-	8
🖃 🙆 Opened Trip									a
📰 Start New Trip	Area	Code	Specie	Min Size	Min Weight	Cuota			
🚍 View / Edit	VIIIc	000	Other			Unlimited			
- 🎦 Finish Trip	VIIIc	ARU	Greater argentine			Unlimited			
	VIIIc	BOC	Boarfish			Unlimited			
🧑 Hauls	VIIIc	COD	Atlantic cod	35		Unlimited			
💷 Summary	VIIIc	CQL	Hollowsnout grenadier			Unlimited			
📐 Map	VIIIc	DAB	Common dab			Unlimited			
Reglr. iObserver Catch	VIIIc	GHL	Greenland halibut			Unlimited			
	VIIIc	GUR	Red gurnard			Unlimited			
	VIIIc	PLA	Amer. plaice(=Long rough dab)			Unlimited			
Master Data	VIIIc	SYC	Small-spotted catshark			Unlimited			
•	VIIIc	WIT	Witch flounder			Unlimited			
Gears	VIIIc	ANK	Blackbellied angler			Yes			
Harbours	VIIIc	HKE	European hake	27		Yes			
Area Species	VIIIc	HOM	Atlantic horse mackerel	15		Yes			
- J Species	VIIIc	LDB	Four-spot megrim	20		Yes			
Unwanted Reasons	VIIIc	MAC	Atlantic mackerel	20		Yes			
	VIIIc	MEG	Megrim	20		Yes			
··· M Metiers	VIIIc	MON	Angler(=Monk)			Yes			
Areas	VIIIc	RHG	Roughhead grenadier			Yes			
🤍 Fishing Grounds	VIIIc	RJC	Thomback ray			Yes			
🕅 Shin Data 🗸 🗸	VIIIc	RJN	Cuckoo ray			Yes			
>	VIIIc	WHR	Rue whiting(-Poutessou)			Yee			

Master Data: Areas Species







ISEAS

Navigation Characterist	ics List						-	ć
· 🙆 Trip			Date	Filter 🗹 0	6/06/2018	- 07/0	06/2018 🗸	
- 📫 Start New Trip				_				_
🦳 View / Edit	Date UTC	Latitude	Longitude -8.789309251	Course	Speed 54.087	Depth		
🚽 Finish Trip	07/06/2018 7:13:35	42.3720045583333		15.63			1	
	07/06/2018 7:12:33	42.40155381	-8.70696688133333	350.1	54.125			
🍈 Hauls	07/06/2018 7:10:30	42.3570666213333	-8.83849093033333	16.3	54.102			
- 📶 Summary	07/06/2018 7:08:28	42.2804021121667	-8.9895168505	22.04	54.085			
📐 Мар	07/06/2018 7:06:25	42.2401193956667	-9.16984807583333	17.38	53.694			
Regir. iObserver Catch	07/06/2018 7:04:23	42.1896286006667	-9.34395249283333	27.88	53.696			
" 💟 Hegii. Iobserver calch	07/06/2018 7:02:20	42.1587700073333	-9.42496579416667	6.9	54.095			
	07/06/2018 7:00:18	42.1889146881667	-9.43066543483333	42.67	54.093			
<u></u>	07/06/2018 6:58:16	42.23262778666667	-9.30955623566667	13.4	53.694			
- 🤛 Master Data	07/06/2018 6:56:13	42.2642370183333	-9.12791544016667	19.19	53.694			
- 🛞 Ship Data	07/06/2018 6:54:11	42.3045092223333	-8.94752199916667	21.25	54.084			
- 🥅 Finished Trips	07/06/2018 6:52:08	42.3720718068333	-8.788986367	15.63	54.087			
- Tinished Hauls	07/06/2018 6:51:06	42.4015968255	-8.70730006283333	350.1	54.125			
	07/06/2018 6:50:04	42.3791285891667	-8.750552003	35.23	54.094			
- 🔧 Settings	07/06/2018 6:49:02	42.3566426483333	-8.84043302533333	16.33	54.096			
- 🏹 Synchronize Data	07/06/2018 6:47:00	42.2798339386667	-8.99138783983333	22.04	53.697			
- 🚮 iObserver Sync	07/06/2018 6:44:58	42.2397392641667	-9.1714513475	17.38	54.083			
- 🕵 Navigation Char. Monitor	07/06/2018 6:43:56	42.2201317715	-9.263229766	17.29	53.696			
	07/06/2018 6:41:53	42.1556284716667	-9.41661621116667	54.55	53.859			
- 🕕 About	07/06/2018 6:39:51	42.1700849405	-9.4292474045	43.03	54.094			
	07/06/2018 6:38:49	42.1867574025	-9.43368226833333	59.38	54.078			

Navigation Characteristics screen



😨 iSEAS RedBox - [System Prefe	erences]						—		×	:
Section Strategy Editing Preferences								-	8	×
🖃 🦉 Trip	🕪 ОК	🔀 Cancel								
🕂 Start New Trip	General	Database	Synchronization	Navigation Caracte	eristics	iObserver Integration				
💾 View / Edit	Ship	ID	BOVE-)1						
Finish Trip	Ship	kev	•••••							
Hauls	Lang		EN - Er	alieh		~				
U Summary				cal with Timezone		UTC				
Map Reglr. iObserver Catch		format			_					
	Coord	dinates format		grees, min, sec.	۲	Degrees only				
	Close	password								
🕀 🔛 Master Data	Confi	rm close pass	word							
🛞 Ship Data										
- 🧮 Finished Trips										
- 🔜 Finished Hauls										
🔧 Settings										
- 🦉 Synchronize Data										
ன iObserver Sync ঝ Navigation Char. Monitor										
About										
	J									
Status: System RedBox	ready		Sottin	gs screen						.::

4.3. RedBox tests

4.3.1. Installation tests

In addition to the integration tests with the iObserver system software at the IIM facilities, several visits were made to both oceanographic and commercial vessels in order to analyze the working environment, instrumentation technologies and existing communications on board and for the realization of the installation tests of the RedBox software and its connection to the navigation and satellite transmission instruments as well as the iObserver system. Based on the experience gained, the software was developed and extended to make it adaptable to the different hardware configurations of each ship.





iObserver system

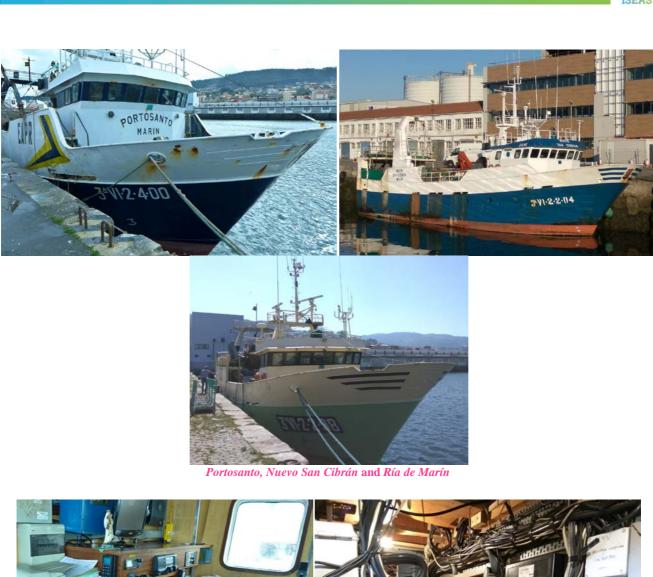
The installation tests on oceanographic vessels were carried out on two vessels of the Secretaría General de Pesca: the *Miguel Oliver* and the *Vizconde de Eza*. The RedBox application was installed on a laptop PC that was placed in different locations, from the bridge to a room adjacent to the fishing processing room. The data of the navigation instruments were received by the ship's data network, UDP protocol. This network also provided connectivity to the central server in CESGA.



B/O Miguel Oliver and B/O Vizconde de Eza

The installation tests of the RedBox in commercial ships were carried out in three ships of Marín: *Portosanto, Nuevo San Cibrán* and *Ría de Marín*. The tests were performed with the RedBox application installed on a laptop PC located on the ship's bridge. Despite differences in format, it was possible to capture the data of the GPS installed on board in the three ships. No data could be obtained from the depth probe, generally the probes did not have NMEA output. Regarding the data transmission equipment, in the *Portosanto* it was possible to establish a connection with the installed Inmarsat satellite equipment. In the *Nuevo San Cibrán* and in the *Ría de Marín* the connection was made through mobile network routers available in the ships.







1.- RedBox system on the bridge of Portosanto 2.- Equipment and wiring of Nuevo San Cibrán

4.3.2. Test trips





Several test campaigns have been completed with the RedBox software on board both oceanographic and commercial vessels. The tests allowed debugging the operation of the software and, in collaboration with the observers in charge of its operation, improvements were detected and agreed upon in its use in a real work environment, especially in regard to the interaction between the software and the operator that is in charge of its management, automate the processes of data capture to the maximum and speed up its management. Observers from the IEO were in charge of operating the RedBox software in the oceanographic campaigns and from the IIM in the commercial trips.

Oceanographic campaigns carried out:

- "Pelacus" from April 16 to 31. B/O Miguel Oliver. ICES VIIIc and IXaN areas.
- "Flemish Cap" from June 23 to July 22. B/O Vizconde de Eza. NAFO 3M area.
- "Fletán Negro" from July 28 to August 17. B/O Vizconde de Eza. NAFO 3L area.
- "*Porcupine 2016*" from September 10 to October 11. *B/O Vizconde de Eza*. ICES VIIb, VIIc2 and VIIk2 areas.
- "*Demersales 2016*" from September 17 to October 23. *B/O Miguel Oliver*. ICES VIIIc and IXaN areas.
- "Platuxa 2017", from May 15 to June 16. B/O Vizconde de Eza. NAFO 3NO areas.
- "*Fletán Negro 2017*", from July 20 to August 9. *B/O Vizconde de Eza*. NAFO 3L area.
- "*Porcupine 2017*", from August 24 to September 22. *B/O Vizconde de Eza*. ICES VIIb, VIIc2 and VIIk2 areas.
- "Descarsel 2017", from August 30 to September 10. *B/O Miguel Oliver*. ICES VIIIc and IXaN areas.
- "Demersales 2017", from October 3 to 23. B/O Miguel Oliver. ICES VIIIc area.

Commercial trips made:

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- *Portosanto* trawler: four trips in June and July of 2017 and February and March of 2018. Area ICES IXaC, near Portugal.
- *Ría de Marín* trawler: eight trips between February and June 2018. Areas ICES IXaN and VIIIc, Atlantic area of Galicia.

Ship	Trip	Hauls	Catch lines (manual)	Catch lines iObserver	Specims. iObserver	Total weight (kg)	Navigat. lines	GPS (%)	Depth Probe (%)
Miguel Oliver	Pelacus 2016	15	19	-	-	12540	5419	99	99
Vizconde de Eza	Flemish Cap 16	182	400	-	-	15179	7963	29	67
Vizconde de Eza	Fletán Negro 16	105	286	-	-	7333	3611	39	33
Vizconde de Eza	Porcupine'16	85	702	-	-	42260	7328	86	25
Miguel Oliver	Demersales'16	130	94	-	-	39096	9819	100	100

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Portosanto	13/6/17-19/6/17	28	159	0	0	19800	0	0	0
Portosanto	17/7/17-25/7/17	31	0	270	25408	893196	1802	79	0
Vizconde de Eza	Platuxa'17	109	22	2	1202	78	3175	39	39
Vizconde de Eza	Fletán Negro'17	103	0	157	54693	333444	2616	46	3
Vizconde de Eza	Porcupine'17	88	0	208	369181	151868	1413	17	0
Miguel Oliver	Descarsel'17	1	1	0	0	230000	393	12	12
Miguel Oliver	Demersales'17	67	0	363	40854	21133	3996	70	0
Portosanto	30/1/18-6/2/18	27	0	19	6511	27030	1999	99	-
Portosanto	6/3/18-9/3/18	13	-	-	-	-	739	99	-
Ría de Marín	21/2/18-22/2/18	4	0	15	3146	3861	117	45	-
Ría de Marín	25/2/18-27/2/18	4	0	15	2466	2982	196	65	-
Ría de Marín	13/3/18-14/3/18	6	0	42	20889	7054	388	100	-
Ría de Marín	22/3/18-23/3/18	4	0	-	-	-	280	100	-
Ría de Marín	1/4/18-2/4-18	4	0	-	-	-	308	100	-
Ría de Marín	15/4/18-16/4/18	4	0	-	-	-	293	100	-
Ría de Marín	6/5/18-7/5/18	4	0	22	22356	8318	301	99	-
Ría de Marín	10/6/18-11/6/18	4	0	-	-	-	299	99	-

Recorded data summary

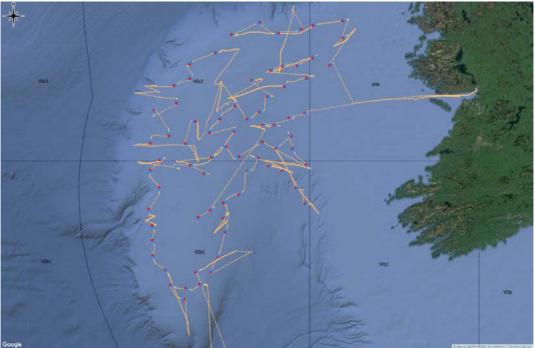
The software was able to operate 24 hours a day during all the trips except the campaign "*Descarsel 2017*" in which there were some problems of inadvertent closures due to application errors that prevented data capture. This problem was solved in the following versions. The tests of manual data entry went smoothly, some improvement possibilities were detected to speed up the process that were applied in successive versions. The iObserver data capture tests were positive in terms of processing the data received by the RedBox, although there were problems in receiving the data, not being able to receive the information in several trips (see attached table). Regarding navigation instruments, GPS data was received in general terms although there were temporary losses in reception. The processing of GPS signals was refined and improved to minimize losses, although often these losses had an external cause: in the case of oceanographic vessels due to problems with the origin of the signal and, in the case of commercial ones, to problems easily solvable as disconnected or defective cables. The depth probe data was generally poor or non-existent. Regarding the transmission of data to the central server, there were some occasional connection losses due to maintenance tasks of the server or due to lack of coverage, especially in the trips in remote areas such as the *Vizconde de Eza* campaigns in NAFO areas, but the transmission of all the data for all the trips was achieved.

In conclusion, the test trips were very useful for the achievement of the objective of obtaining a fully operational and efficient RedBox application despite the difficulty of having a precarious contact line,





not to mention that nonexistent at times, with the ships on high seas and the 24 hour/7 day schedules that do not always allow to solve a problem at the moment it happens.

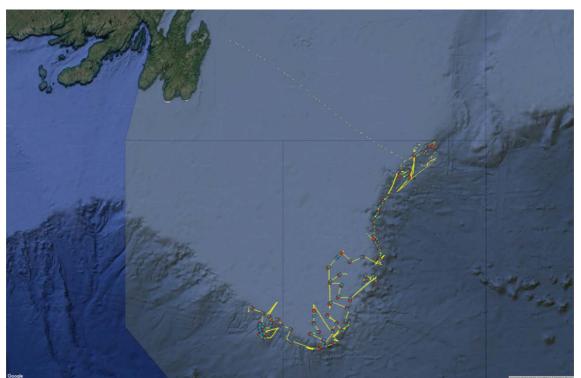


"Porcupine 2016" Campaign

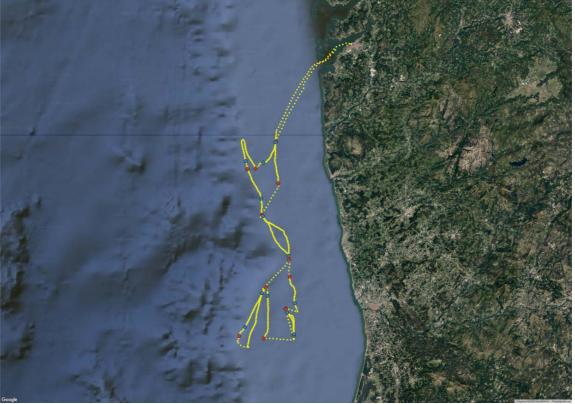


'Demersales 2016'' Campaign





'Platuxa 2017' Campaign



Portosanto Trip March 2018

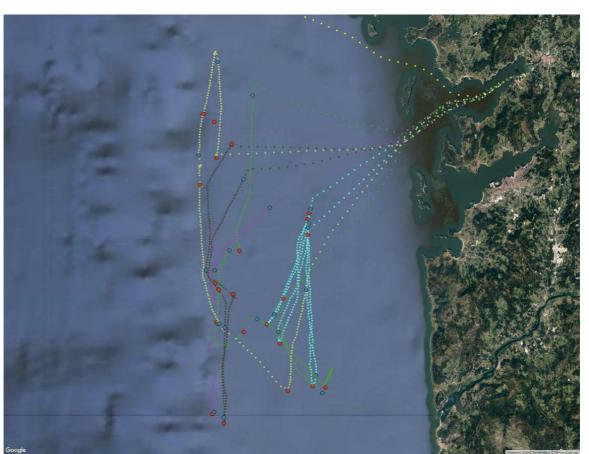








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Ría de Marín Trips 2018

5. Geoportal

5.1. Map Viewer

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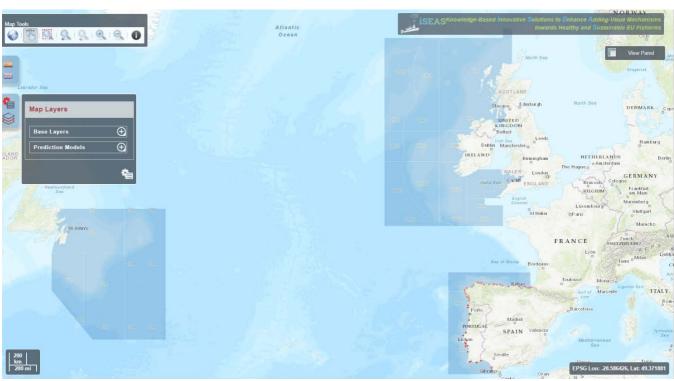
The Geoportal is built with the map viewer as the main component. The viewer presents a reference background map with bathymetry, several toolbars for navigation and control of the available information layers such as ports and reference areas. It is available in English and Spanish.

The geographic areas used in the project include the ICES VIIIc, and IXa areas in the Atlantic and Cantabrian peninsula, the ICES areas VIa, VIb1, VIb2, VIIb, VIIf, VIIg, VIIh, VIIc1, VIIc2, VIIj1, VIIj2, VIIk1 and VIIk2, close to Ireland and the NAFO 3L, 3M, 3N and 3NO areas to the southwest of Newfoundland. The subdivision of the ICES IXa area in areas IXaN, IXaC and IXaS was agreed with the IEO.

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Geoportal Viewer

The Geoportal has two versions: a public, free access one with generic information and layers with the results of some static models and a private one that, in addition to the information offered in the public, allows access to the fishing data, filtered according to the user access permissions, and dynamic prediction models. An access portal to the viewer allows the user to choose between the public or private part, which requires the identification of the user and, depending on his role, filters the information to which he can access. The portal is accessible from the address <u>http://iseas.cesga.es</u>



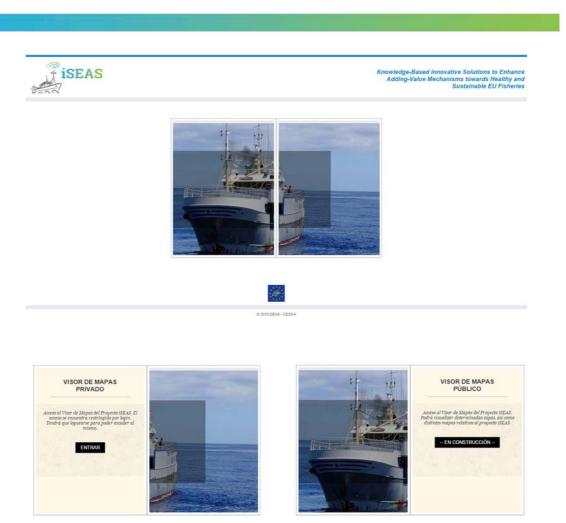


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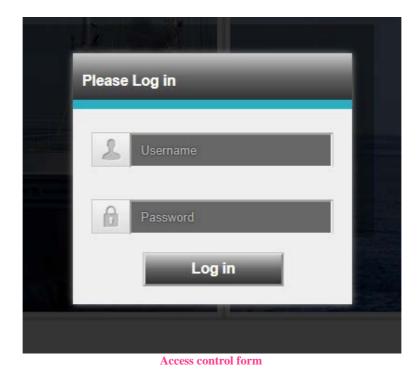






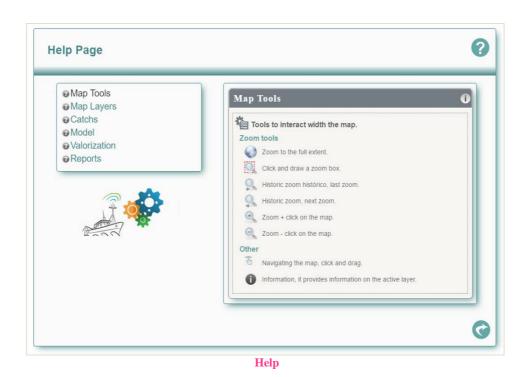


Viewer Access portal



The viewer has a help section with the description of its functionalities.

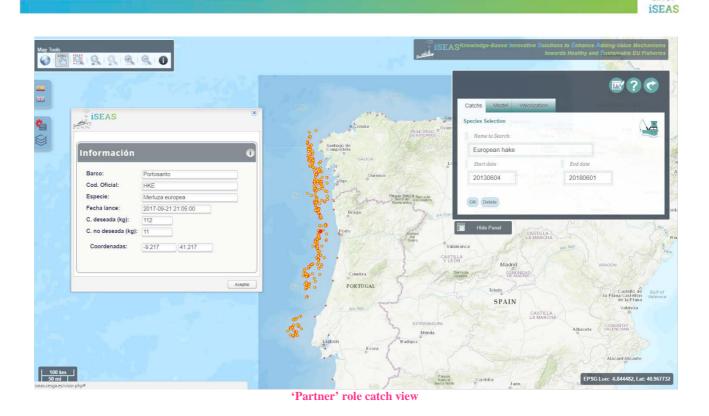




5.2. Catch

By means of a drop-down panel the user can access the catch search form which, for a species and a period of time, shows on the map the hauls for the selected species. Clicking on each haul a window with detailed information is displayed: name of the ship, date, species, wanted catch weight and unwanted catch weight. A user with the shipowner role can see the catch data of his ships in the viewer. A partner of the project will enter with the role of partner and will be able to access the data of all the ships.





5.3. Models

There are three types of models available, all developed by the IEO: Fishing Suitability Index Model (FSI), Fuel Efficiency Model and the vulnerable species hotspots models. The first two are generated dynamically with the catch data existing in the project database. Those of vulnerable species are static and have been pre-calculated with the IEO data.

5.3.1. Fishing Suitability Index Model (FSI)

The FSI model of fishing suitability provided by the IEO is incorporated into the model section of the viewer.

For an objective species, the FSI index indicates the probability that a site will maintain discards below a permissible discard rate given the environmental characteristics and previous fishing data for a given period of time. The FSI concept offers information on the best areas suitable for fishing activities, minimizing discards.

In the form parameters for the model it must be specified the metier, which will determine the fishing areas for which the modeling will be done, one or several target species, a time interval (the shorter, the more relevant the modeling by temporary closeness, but less will be the number of samples available to



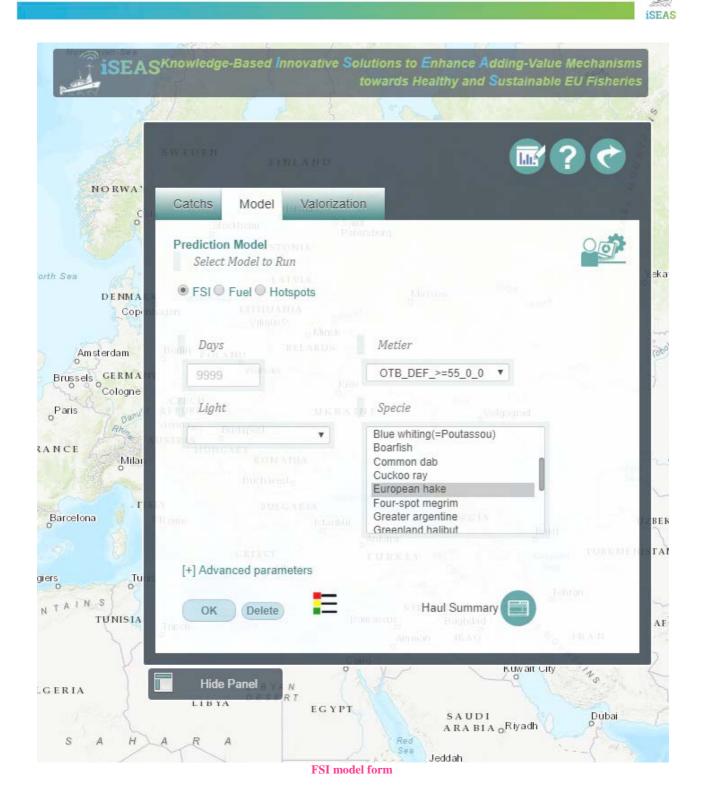


feed the model), optional filtering by day or night hauls and, as advanced parameters, minimum desired catch and maximum unwanted capture percentage.

From the input parameters, the capture data that feeds the model is filtered and the R language script that calculates the FSI is executed.

The results are presented in a layer in the viewer as a dotted grid with a color code that represents the value of the FSI index for each point and in a second layer with the average result of the FSI index for the fishing areas delimited by the IEO from Vessel Monitoring System (VMS) data.



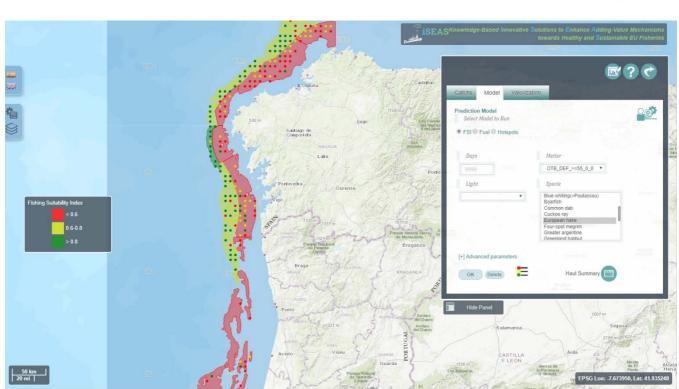




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FSI model result

Within the form there is a button to open a summary screen of the hauls available in the project database to serve as a guide in the execution of the models.

cies and year							
	_	-	_	_	_		_
Specie 🔺	2014	2015	2016	2017	2018		
■ Metier: Bottom otter trawl directed	to hake in we	stern EU					
Metier: Bottom otter trawl directed	l to megrim in	western El	J				
■ Metier: Otter bottom trawl directed	to crustacea	ns					
■ Metier: Otter bottom trawl directed							
Amer. plaice(=Long rough dab)		0	0	0	0	J	
Angler(=Monk)	0	0	0	0	0		
Atlantic cod	0	0	0	0	0		
Atlantic horse mackerel	12	85	9	125	0		
Atlantic mackerel	11	34	11	79	0		
Atlantic redfishes nei	0	0	0	0	0		
Blackbellied angler	0	0	0	0	0		
Blue whiting(=Poutassou)	34	79	27	129	0		
Boarfish	5	29	2	73	0		
Common dob	0	0	0	0	0		
							(









5.3.2. Fuel Efficiency Model

The second model of the Viewer is the Fuel Efficiency model. This model adds to the FSI model the economic part and estimates the expected income from the catch and the expenses associated to the fishing activity.

To execute the model there are a series of parameters to filter the fishing data that feed it as in the FSI model: metier, time interval in days until the current date and optional filtering by day or night sets. Additionally there are some parameters to configure the characteristics of the ship and its activity, these parameters include: ship power, average navigation speed, fuel price, fixed costs per day, ports of departure and unload, number of days of the trip, number of hauls per day and duration of each haul. It can be selected a specific ship already registered so that the parameters of past trips and / or model executions can be loaded.

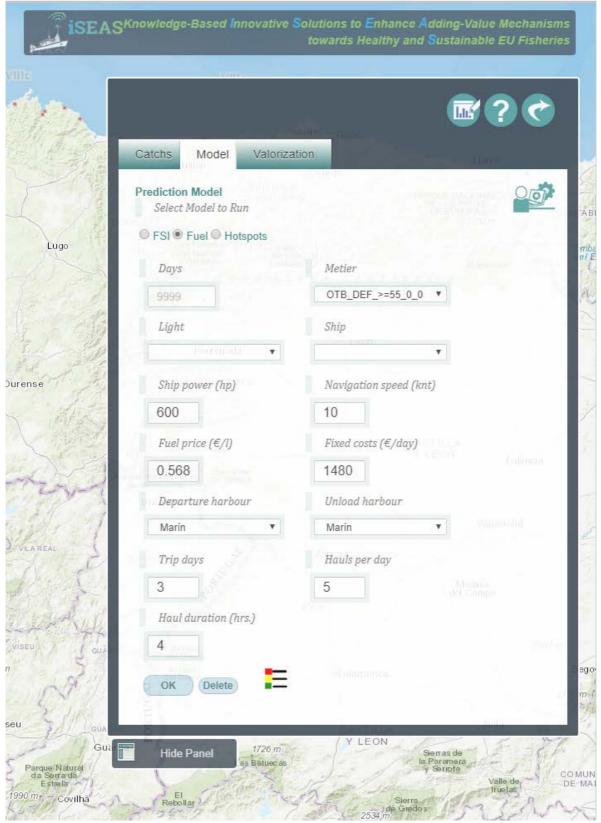
The result obtained shows an estimate of the benefit per haul for each fishing zone.





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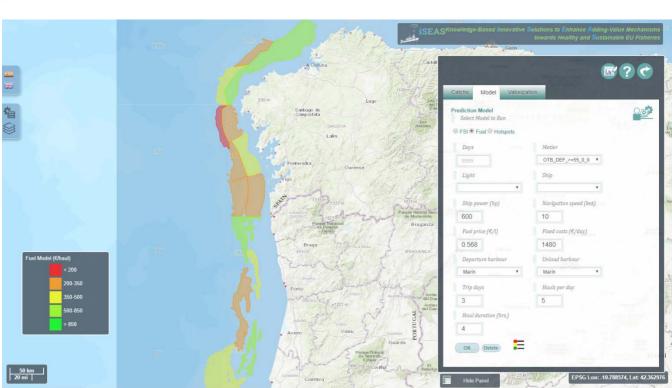


Fuel Efficiency Model form



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Fuel Efficiency Model result

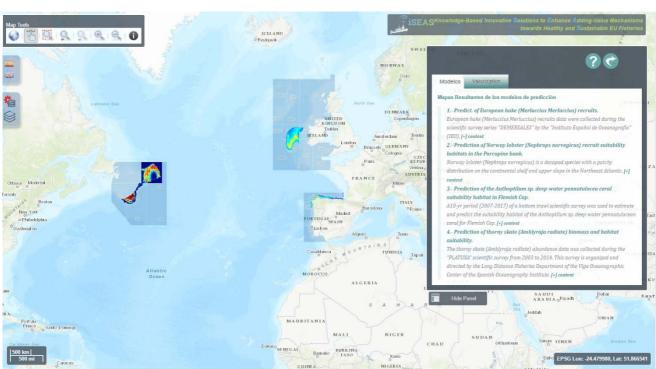
5.3.3. Models of concentration of vulnerable species

The vulnerable species concentration models are accessible from both the public part of the Viewer and the private part.

These models identify the areas where a higher concentration of certain protected species such as the pennatulaceous and the thorny skate or recruits of commercial species such as european hake and Norway lobster are expected from data collected in scientific campaigns of the IEO. One species was chosen per reference area of the project.

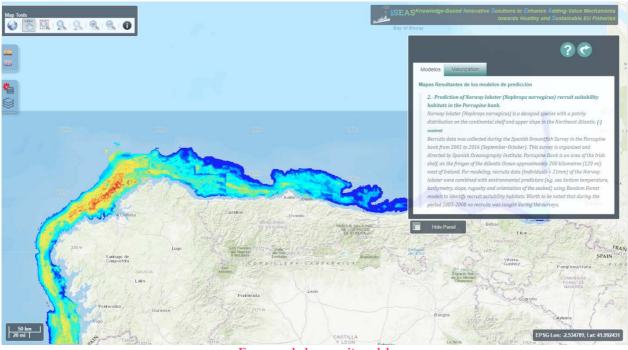
These models are static; they are pre-calculated for specific years.





Public Viewer and Models of concentration of vulnerable species

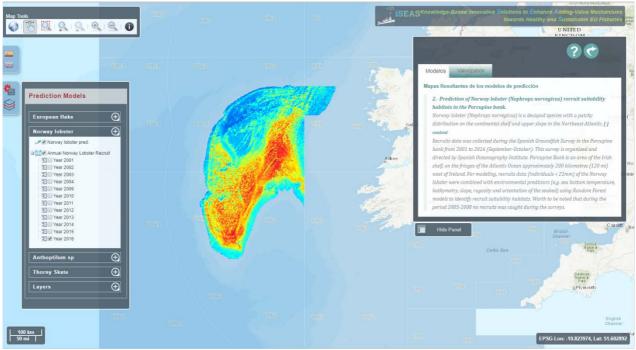
Hake Recruitment Model: The prediction model of the European hake recruit is calculated from data collected in scientific campaigns of the IEO between 1997 and 2016 for the northwest and Cantabrian area.



European hake recruit model



Nephrops Recruitment Model: The prediction model of suitable habitat for Norway lobster recruits (Nephrops norvegicus) is calculated from data collected during the IEO trawl scientific campaigns at the Porcupine bank during the period 2001-2016. A layer selection tree was included to choose the desired annual model.

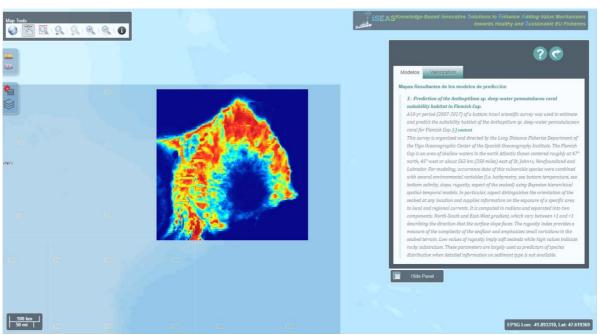


Norway lobster recruit model

Model of the Pennatulacean: The prediction model of the Anthoptilum sp. deep-water pennatulacea coral suitability habitat is calculated from data collected in scientific bottom trawling campaigns of the IEO between 2007 and 2017 for the Flemish Cap area.

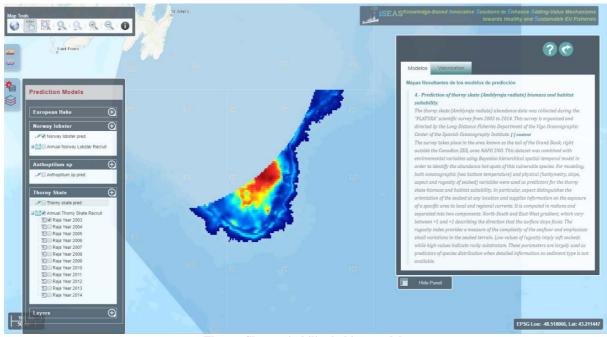


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Pennatulacea coral suitability habitat model

Thorny Skate Model: The prediction model of the biomass and the ideal habitats of the thorny skate (Amblyraja radiate) is calculated from data collected in the "Platuxa" scientific campaigns of the IEO between 2003 and 2014 for the tail of the Grand Bank in the NAFO 3NO divisions. A layer selection tree was included to choose the desired annual model.



Thorny Skate suitability habitat model



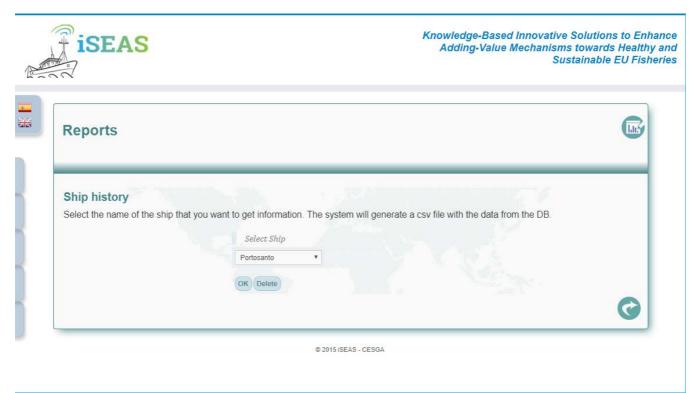
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5.4. Reports

5 types of downloadable reports in spreadsheet format can be generated in the Geoportal, with the data from the database. Each report has a form with various parameters to filter the data obtained. These data are also filtered according to the user and their role.

5.4.1. Ship history

Provides general ship information with the change history.



Ship History report form

	А	В	С	D	E	F	G	Н	- I	J	K
1	ship_name	hp	grt	gt	length_over	harbour	max_crew_s	date	id_ship	shipowner_r	name
2	Portosanto		167	167		Vigo	9	2016-12-09	VI-2-4-00	Armador de	prueba
3											
4											
5											
6											
7											
8											
9											

Ship History report







5.4.2. Trip report

General information about trips.

Reports		Lin
Trip report		
Start date	Metier Select Metier •	Harbour Select harbour
Enter start date		
End date	Ship Portosanto •	Length Min Max
Enter end date	Area Select area 🔻	Fishing equipment Select fishing equipment
	OK Delete	
		G
	© 2015 ISEAS - CES0	3A
	Trip report fo	rm

Trip report

5.4.3. Haul report

2022284444444444444444444

Information about hauls with a summary of the catches.



ISEAS

iseas		Knowledge-Based Innovative Solutions to Adding-Value Mechanisms towards He Sustainable EU
Reports		
Haul report		~
Start date	Metier Select Metier V	Harbour Select harbour
Enter start date		
End date	Area Select area 🔻	
Enter end date	Ship Select Ship	Length Min Max
	HP Min Max	TRB Min Max
	Light Choose •	Depth Min Max m.
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Haul report form

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KA160314C	2016	1 2016-03-1E Ka	12 ESVGO	Vigo	ESLCG ESI	386	2 Arrastre de B/O Miquel BOMO-01	2,71	3.8 t	HOM MAC.'s	2016-03-15 2016-03-15			-9.43191		1046.45						0
KA160314C	2016	1 2016-03-1E Ka	12 ESVGO	Vigo	ESLOGES	387	2 Arrastre de B/O Miguel BOMO-01	351.19	3.8 1	WHB MAC II	2016-03-15 2016-03-15					1224.77	20	200	0	200	200	0
KA160314C	2016	1 2016-03-1E Ka	13 ESVG0	Vigo	ESLCGES	388	2 Arrastre de B/O Miguel BOMO-01	269.43	8.6 1	WHB F	2016-03-16 2016-03-16			-9.32448	-9.31066	230.89	15	140	0	140	140	ő
KA160314C	2016	1 2016-03-15 Ka	130 ESVG0	Vigo	ESLCGES	389	2 Arrastre de B/O Miguel BOMO-01	226.15	8.3 (HOM /	2016-03-15 2016-03-15			-8.8441	-8.88854	40.97	10	no	~	140	PRO	0
IXA160314C	2016	1 2016-03-2(Ka	14 ESVGO	Vigo	ESLCG.ESI	390	2 Anastre de B/O Miguel BOMO-01 2 Anastre de B/O Miguel BOMO-01	207.39	10.3 1	HOM F	2016-03-2(2016-03-2)			-9.07197	-9.1266	40,57						0
KA160314C	2016	1 2016-03-21 Ka	14 ESVGO	Vigo	ESLCG.ESI	391	2 Anastre de BIOMiguel BOMO-01 2 Anastre de BIOMiguel BOMO-01	85.87	4,7 1	HOM WHB F	2016-03-21 2016-03-21 2016-03-21			-9.351	-9.46794	158.43						0
KA160314C	2016	1 2016-03-2 Ka	14 ESVGO	Vigo	ESLCGES	393	2 Arrastre de B/O Miguel BOMO-01 2 Arrastre de B/O Miguel BOMO-01	31.14	9.2 1	HOM F	2016-03-2 2016-03-2			-9.15254	-9.08008	84.9						0
IXA160314C	2016	1 2016-03-21 Vilo	15 ESVGO	Vigo	ESLCG.ESL	394	2 Anastre de BIO Miguel BOMO-01 2 Anastre de BIO Miguel BOMO-01	341,51	381	HOM F	2016-03-2, 2016-03-2			-9.08069	-9.03168	144.72	20	321,53	80	24153	24153	0
IXA160314C	2016	1 2016-03-24 Vilo	150 ESVGO	Vigo	ESLCGES	394	2 Anastre de B/O Miguel BOMO-01 2 Anastre de B/O Miguel BOMO-01	341,51	3.8 1	HUM F	2016-03-24 2016-03-24 2016-03-24				-9,03168	199,72	32,5	321,53	89	24153	24153	0
																			2190	60	0	0
IKA160314C	2016	1 2016-03-2! Vilo	160 ESVGO	Vigo	ESLCG, ESI	396	2 Arrastre de B/O Miguel BOMO-01	128,54	2,2 t	HOM, WHB, F	2016-03-21 2016-03-21			-8,166	-8,18647	155,62	23,5	2190	2190	0	288	0
IKA160314C	2016	1 2016-03-2! Vilo	150 ESVGO	Vigo	ESLCG,ESI	397	2 Arrastre de B/O Miguel BOMO-01	155,96	4,4 t	HOM MAC.LE	2016-03-21 2016-03-21		43,78316	-8,03183	-8,03275	158,3	17,3	288	0	288		0
IXA160314C	2016	1 2016-03-3' Villo	1600 ESVGO	Vigo	ESLCG.ESI	398	2 Arrastre de B/O Miguel BOMO-01	126,73	9,4 1	HKE, WHB, M	2016-03-3 2016-03-3			-7,62025	-7,62025	44,15	11	100	0	100	100	0
IXA160314C	2016	1 2016-03-3(Villo	1600 ESVGO	Vigo	ESLCG,ESI	399	2 Arrastre de B/O Miguel BOMO-01	271,62	0,9 t	MAC, HDM, H	2016-03-3(2016-03-3)			-7,59082	-7,62025	27,54	20	297	0	297	297	0
IKA150314C	2016	1 2016-03-3' Vilo	1600 ESVG0	Vigo	ESLCG,ESI	400	2 Arrastre de B/O Miguel BOMO-01	4,71	8,7 t	WHB,HOM, F	2016-03-3 2016-03-3			-7,48135	-7,48134	152,82	20	3860	3000	860	860	0
DKA160314C	2016	1 2016-04-0' Vilic	1600 ESVGO	Vigo	ESLCG.ESI	401	2 Arrastre de B/O Miguel BOMO-01	177,38	10,7 t	HKE,HOM,N	2016-04-0 2016-04-0					162,25	30	5000	5000	0	0	0
VIIIC160917	2016	3 2016-09-1E Ka	12 ESVGO	Vigo		719	2 Arrastre de B/O Miguel BOMO-01	338,46	2,5 t	HKE F	2016-09-12 2016-09-12			-9,31098	-9,31177	167,32	25	49,727	5,54	44,187	44,187	0 Lan
VIIC160317	2016	3 2016-09-1E Ka	13 ESVGO	Vigo		720	2 Arrastre de B/O Miguel BOMO-01	334,51	3 (LDB,MEG,F (2016-09-16 2016-09-16			-9,43849		568,99	35	10	7,36	2,64	2,64	0 Lan
VIIC160917	2016	3 2016-09-16 Ka	13 ESVGO	Vigo		721	2 Arrastre de B/O Miguel BOMO-01	211,43	4,9 t	ANK, WHB, LF	2016-09-16 2016-09-16				-9,29051	185,47						0 Lan
VIIC160917	2016	3 2016-09-1E IXa	13 ESVGO	Vigo		722	2 Arrastre de B/O Miguel BOMO-01	181,36	2,7 1	MON, WHB, F	2016-09-16 2016-09-16			-9,35494	-9,35644	228.37	26	124,83	109,04	15,79	15,79	0 Lan
VIIC160917	2016	3 2016-09-17 Ka	13 ESVGO	Vigo		723	2 Arrastre de B/O Miguel BOMO-01	352,81	5,1 t	LDB,HKE,H /	2016-09-17 2016-09-16					135,65	23,3	16,095	8,33	7,765	7,765	0 Lan
VIIC160917	2016	3 2016-09-17 Ka	12 ESVGO	Vigo		724	2 Arrastre de B/O Miguel BOMO-01	193,47	3,3 t	HKELDB.H F	2016-09-17 2016-09-18				-9,30763	112	25	21,45	14,75	6.7	6,7	0 Lan
VIIC160917	2016	3 2016-09-17 Ka	130 ESVGO	Vigo		725	2 Anastre de B/D Miguel BDMD-01	179,99	3,9 (HKE, WHB, H	2016-09-17 2016-09-18	42,07336	42,19973	-8,98971	-9,44498	103,53	26,8	128,46	88,73	39,73	39,73	0 Lan
VIIC160917	2016	3 2016-09-15 Ka	14 ESVGO	Vigo		726	2 Arrastre de B/O Miguel BOMO-01	135,11	3 t	MON LDB, \ f	2016-09-15 2016-09-15	42,53482	42,51694	-9,40309	-9,38088	254,59	37,5	182,735	14,84	167,895	167,895	0 Lana
VIIC160917	2016	3 2016-09-15 Ka	13 ESVGO	Vigo		727	2 Anastre de B/D Miguel BOMD-01	176,65	2,6 t	MON/MEG/I f	2016-09-15 2016-09-15	42,27954	42,24814	-9,46009	-9,46361	518,96	32,5	49,095	10,475	38,62	38,62	0 Lan
VIIC160917	2016	3 2016-09-15 Ka	13 ESVGO	Vigo		728	2 Anastre de B/O Miguel BOMO-01	333,04	2,9 t	MON, HOM, I	2016-09-15 2016-09-15	42,27545	42,29611	-9,34028	-9,35571	236,06	28,5	32745	18755	13990	13990	0 Lan
VIIC160917	2016	3 2016-09-15 Ka	13 ESVGO	Vigo		729	2 Arrastre de B/O Miquel BOMO-01	340.37	4.4 1	HKE.HOM.41	2016-09-15 2016-09-15	42.35674	42.38134	-9.16531	-9,17479	145.77						0 Lan
VIIC160917	2016	3 2016-09-2(Ka	13 ESVGO	Vigo		740	2 Anastre de B/O Miquel BOMO-01	225.89	3.3 1	HOM WHB /	2016-09-21 2016-09-21	42,15931	42.14029	-9.05785	-9.07749	134.29						0 Lan
VIIC160917	2016	3 2016-09-2(Ka	13 ESVGO	Vigo		741	2 Arrastre de B/O Miquel BOMO-01	23.05	2.8 t	HKELDB.H.f	2016-09-2(2016-09-2)	42.17468	42,19472	-9.18213	-9.16722	158.9						0 Lan
VIIC160917	2016	3 2016-09-2(Ka	13 ESVGO	Vigo		742	2 Anastre de B/O Miguel BOMD-01	153.53	31	MEG.MON. /	2016-09-2(2016-09-2)	42.27602	42,25587	-9.11653	-9.10095	139						0 Lan
VIIC160917	2016	3 2016-09-2(Ka	130 ESVGO	Vigo		743	2 Arrastre de B/D Miquel BDMD-01	156.58	3.1 t	MEG.WHB.IT	2016-09-2(2016-09-2)	42 23902	42 21594	-8.97862	-8.96837	101.71						0 Lan
VIIC160917	2016	3 2016-09-2" IXa	14 ESVGO	Vigo		744	2 Arrastre de B/O Miguel BOMO-01	344.78	3.4 1	HOMHKEAF	2016-09-2 2016-09-2			-9.29056	-9.29208	139.1						0 Lan
VIIC160917	2016	3 2016-09-2" Ka	14 ESVGO	Vigo		745	2 Anastre de B/O Miquel BOMO-01	36.07	2.7 1	LOB MON H	2016-09-2 2016-09-2				-9.21399	103.01						0 Lan
VIIC160917	2016	3 2016-09-2 Ka	14 ESVGO	Vigo		746	2 Arrastre de B/O Miquel BOMO-01	311.16	3.7 1	ANK MEG.11	2016-09-2 2016-09-2			-9.35217	-9.37647	127.49						0 Lan
VIIC160917	2016	3 2016-09-2" Ka	14 ESVGO	Vigo		747	2 Arrastre de B/O Miguel BOMO-01	327.48	351	HKE MEGLI	2016-09-2 2016-09-2			-9.55175	-9.58718	456.24						0 Lar
VIIC160917	2016	3 2016-09-27 Ka	14 ESVGO	Vigo		748	2 Arrante de B/O Miguel BOMO-01	343.28	4.3 t	MONLOBH	2016-09-2; 2016-09-2;				-3.54116	228.97	27,5	460.149	7.999	452.15	452.15	0 Lar
VIIC160917	2016	3 2016-09-2; Ka	14 ESVGO	Vigo		749	2 Anastre de B/OMiguel BOMO-01	22.97	31	ANK HOM LI	2016-09-2; 2016-09-2;					154.53	30	28.25	11.665	16.585	16.585	0 Lar
VIIC160917	2016	3 2016-09-27 Ka	14 ESVGO	Vigo		750	2 Arrastre de B/O Miquel BOMO-01	351.44	4.7 1	WHB.MEG.I	2016-09-2, 2016-09-2,			-9.55337	-9.55886	233.71	22.3	225.149	7,999	217.15	217.15	0 Lan
VIIC160917	2016	3 2016-09-27 Vilo	15 ESVGO	Vigo		751	2 Arrastre de B/O Miguel BOMO-01 2 Arrastre de B/O Miguel BOMO-01	1.77	4.6 t	MEG.MON.LE	2016-09-2; 2016-09-2;				-8,70453	146.13		734.925	36.575	698.35	698.35	0 Lar
VIIC160917	2016	3 2016-03-27 Vilo	15 ESVGO	Vigo		752	2 Arrastre de B/O Miguel BOMO-01 2 Arrastre de B/O Miguel BOMO-01	339,15	3.4 1	MON WHB. I	2016-09-2, 2016-09-2,			-3.56619		236.12	30	570.1	34.4	535,7	535.7	0 Lar
VIIIC160917 VIIIC160917	2016	3 2016-09-2/ Vilc 3 2016-09-2/ Vilc	15 ESVGO	Vigo		752	2 Anastre de B/O Miguel BOMO-01 2 Anastre de B/O Miguel BOMO-01	226,08	3,9 1	HUN, WHB, T	2016-09-2, 2016-09-2, 2016-09-2,			-9,56619		236,12	30.5	147.72	13.895	133.825	535,7	0 Lar
VIIC160917	2016	3 2016-09-2; Vilo	15 ESVGO			753		8.33	3,9 1	HOMMON /	2016-09-2, 2016-09-2, 2016-09-2,			-9,41072		271.14	23.3	362.107	13,895	354.8	354.8	
	2016			Vigo		755	2 Arrastre de B/O Miguel BOMD-01	27.7	2.4 1	MON MEG I F											354,8	0 Lan
VIIC160917	2016	3 2016-09-2. Vilo	15 ESVGO	Vigo		155	2 Arrastre de B/O Miguel BOMO-01	27,7	2,4 t	munumeG.H	2016-09-2: 2016-09-2:	43,34161	43,35892	-9,4034	-3,3/739	264,84	23,3	964,203	9,903	954,3	354,3	0 Lan

Haul report

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5.4.4. Catch report

Detailed information about catches.

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iseas		Knowledge-Based Innovative Solutions to Adding-Value Mechanisms towards He Sustainable EU
Reports		
Catch report		
Enter start date	Metier Select Metier •	Harbour Select harbour
	Area Select area	Ship Select Ship 🔻
End date	HP Min Max	TRB Min Max
	Fishing equipment Select fishing equipmer	
	Light Choose	Depth Min Max m.
	Catch Choose	Size Min Max cm
	Specie	
	Amer. plaice(=Long rough dab) Angler(=Monk) Atlantic cod Atlantic horse mackerel Atlantic mackerel Atlantic redfishes nei Blackhellied angler	
	OK Delete	

Catch report form

A	В	C	D	-	E	F	6.	н	1	1	K	L	M	N	0	P	Q	R	S
1 id_trip	year	quarter	date_ti	ime	ICES_area	ices_rectang	id_ship	id_departu	reid_haul	id_gear	scientific	na a_code	spanish_nan	english_nam	weight	unwanted	is_discard	manual	notes
2 IXA1603140	00 201	5	1 2016-0	3-15	: IXa	12	BOMO-01	ESVGO	38	7	2 Trachurus	s tra HOM	Jurel	Atlantic hors	2	00 QUO1	t	t	
3 IXA1603140	00 201	5	1 2016-0	3-16	(IXa	13	BOMO-01	ESVGO	38	8	2 Microme	a'sti WHB	Bacaladilla	Blue whiting		50 MLS1	t	t	
4 IXA1603140	00 201	5	1 2016-0	3-16	(IXa	13	BOMO-01	ESVGO	38	8	2 Microme	sisti WHB	Bacaladilla	Blue whiting		90 MAR1	t	t	
5 VIIIC16091	7(201)	5	3 2016-0	9-18	(IXa	12	BOMO-01	ESVGO	71	9	2 Capros ap	er BOC	Ochavo	Boarfish	0,1	12 MAR1	t	t	Lance04
6 VIIIC16091	70 201	5	3 2016-0	9-18	(IXa	12	BOMO-01	ESVGO	71	9	2 Lepidorho	omt LDB	Gallo de cua	Four-spot me	5,1	55	f	t	Lance04
7 VIIIC16091	71 201	5	3 2016-0	9-18	(IXa	12	BOMO-01	ESVGO	71	9	2 Lepidorha	omt MEG	Gallo del No	Megrim	0,3	85	f	t	Lance04
8 VIIIC16091	71 201	5	3 2016-0	9-18	(IXa	12	BOMO-01	ESVGO	71	9	2 Merlucciu	is n HKE	Merluza euro	European ha	11	15 CAC2	t	t	Lance04
9 VIIIC16091	71 201	5	3 2016-0	9-18	(IXa	12	BOMO-01	ESVGO	71	9	2 Microme	sisti WHB	Bacaladilla	Blue whiting	7,0	25 QAL1	t	t	Lance04
10 VIIIC16091	71 201	5	3 2016-0	9-18	(IXa	12	BOMO-01	ESVGO	71	9	2 Scomber	sco MAC	Caballa del A	Atlantic mac	9	15 MLS1	t	t	Lance04
11 VIIIC16091	71 201	5	3 2016-0	9-18	(IXa	12	BOMO-01	ESVGO	71	9	2 Scyliorhin	us - SYC	Pintarroja	Small-spotte	16	75 MAR1	t	t	Lance04
12 VIIIC16091	7(201)	5	3 2016-0	9-18	(IXa	13	BOMO-01	ESVGO	77	0	2 Lepidorha	omi LDB	Gallo de cua	Four-spot mi	0	,31	f	t	Lance05
13 VIIIC16091	70 201	5	3 2016-0	9-18	(IXa	13	BOMO-01	ESVGO	72	0	2 Lophius p	isc: MON	Rape blanco	Angler(=Mor	3	,13	f	t	Lance05
14 VIIIC16091	7(201)	5	3 2016-0	9-18	(IXa	13	BOMO-01	ESVGO	72	0	2 Merlucciu	is n HKE	Merluza euro	European ha	3	,92	f	t	Lance05
15 VIIIC16091	71 201	5	3 2016-0	9-18	(IXa	13	BOMO-01	ESVGO	72	0	2 Microme	sisti WHB	Bacaladilla	Blue whiting	2	64 QAL1	t	t	Lance05
16 VIIIC16091	7(201)	5	3 2016-0	9-18	: IXa	13	BOMO-01	ESVGO	72	2	2 Lepidorho	omt LDB	Gallo de cua	Four-spot mi	2	74 DAM1	t	t	Lance07
17 VIIIC16091	71 201	5	3 2016-0	9-18	1Xa	13	BOMD-01	ESVGO	72	2	2 Merlucciu	is n' HKE	Merluza euro	European ha	17	,53	f.	t	Lance07
18 VIIIC16091	7(201	5	3 2016-0	9-18	: IXa	13	BOMO-01	ESVGO	72	2	2 Microme	aisti WHB	Bacaladilla	Blue whiting	13	05 MAR1	t	t	Lance07
19 VHIC16091	70 2010	5	3 2016-0	9-18	: IXa	13	BOMO-01	ESVGO	72	2	2 Scomber	sco MAC	Caballa del A	Atlantic mac	87	43	f	t	Lance07
20 VIIIC16091	7(201	5	3 2016-0	9-18	: IXa	13	BOMO-01	ESVGO	72	2	2 Trachuru:	s tra HOM	Jurel	Atlantic hors	4	80,	f	t	Lance07
21 VIIIC16091	7(201	5	3 2016-0	9-17	: IXa	13	BOMO-01	ESVGO	72	3	2 Lepidorha	omt LDB	Gallo de cua	Four-spot mi	8	33	f	t	Lance03
22 VIIIC16091	71 201	5	3 2016-0	9-17	: IXa	13	BOMO-01	ESVGO	72	3	2 Merlucciu	is n HKE	Merluza euro	European ha	6	44 MLS1	t	t	Lance03
23 VIIIC16091	7(201	5	3 2016-0	9-17	: IXa	13	BOMO-01	ESVGO	72	3	2 Microme	sisti WHB	Bacaladilla	Blue whiting	1,3	25 QAL1	t	t	Lance03
24 VIIIC16091	71 201	5	3 2016-0	9-17	: IXa	12	BOMO-01	ESVGO	72	4	2 Merlucciu	is n HKE	Merluza euro	European ha	14	,75	f	t	Lance02
25 VIIIC16091	7(201	5	3 2016-0	9-17	: IXa	12	BOMO-01	ESVGO	72	4	2 Trachurus	s tra HOM	Jurel	Atlantic hors		6,7 MLS1	t	t	Lance02
26 VIIIC16091	71 201	5	3 2016-0	9-17	(IXa	130	BOMO-01	ESVGO	72	5	2 Lepidorha	omit LDB	Gallo de cua	Four-spot me	1	48 MLS1	t	t	Lance01

Catch report







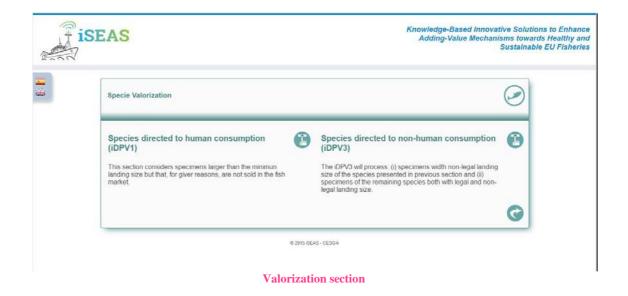


5.4.5. Sizes report

Similar to the catch report, in this case with detailed information on the sizes of the catches.

5.5. Valorization

Geoportal screen with valorization information by species. It includes two sections: one with valorization information for direct human consumption (iDPV1) and another with valorization information for non-human consumption (iDPV3).



The species are presented and a small description is shown along with a photo of a specimen.



SEAS

Specie Valorization		\oslash
Species directed to human consumption (iDPV This section considers specimens larger than the minimun land Valorization:	ling size but that, for giver reasons, are not sold in the fish market.	
Fish Muscle - Restructured food products	Specie - Valorization ()	
3	Tradename Atlantic norse mackerei	C



emaining species both with legal and non-legal landing s	ting size of the species presented in previous section and (ii) specimens of the
ishmeal.	Specie - Valorization Image: Constraint of the system of the sy
2	C

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6. SDI services

6.1. WMS service

Service WMS

WMS or Web Map Service is an international standard that defines a "map" as a representation of geographic information in the form of a digital image file. The maps produced by WMS are usually generated in an image format and can be invoked by any corporate platform or software capable of displaying this type of services, such as desktop GIS.

Within the ISEAS project, two levels of WMS services have been defined, one open to the general public where general data can be accessed, such as the location of ports and ICE areas or the results of the models generated in the prediction project. Radiata ray species, of the Pennatulaceous Anthoptilum sp. in Flemish Cap., and of the ideal habitats for Nephrops conscripts. These models correspond to general models and calculations for different years. Other services will be restricted access served by user control and password, to allow access to private data. This is done with the Geoserver open source geospatial data server through the establishment of a policy of users, groups and roles.

As an example of implementation, a general access service is shown that allows access to layers of information about invocations of a WMS service. The connection address on the WMS service is:

http://iseas.cesga.es/ows

This is the address that should be invoked on any desktop GIS. The connection from the QGIS program is shown below.





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A WMS connection is created

retailes (de la co	meann			
Nombre	iseas				
URL	http://	iseas.cesga.es	s/ows		
Autentio	cación	Configuraci	iones		
		quiere una aut aseña opcional	tenticación básica, intro	duzca un nombre	de
Nombre	de usu	ario			1
Contras	eña				
Referente					
Modo DPI	todo				
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Modo DPI Ignora Ignora	todo ar URI G ar la URI	I GetFeatureInf	fo informada en las cap		
Modo DPI] Ignora] Ignora] Ignora	todo ar URI G ar la URI ar orient	I GetFeatureInf	io informada en las cap les WMS 1.3/WMTS)		

We connect with the service created

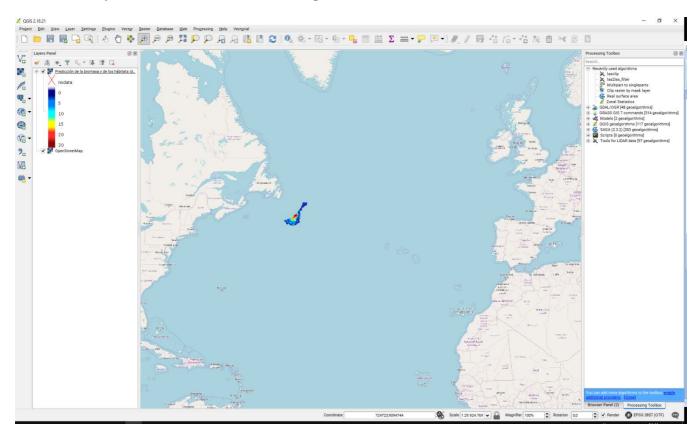
CSIC CESCA opromar



USC OT alleres JOSMAR, SL. CENTRO TECNOLÓGICO DEL MAR ISEAS

Add Layer(s) fr	om a WM(T)S Server		?
yers Layer	Order Tilesets Se	erver Search	
SEAS			
Connect	<u>N</u> ew Ed	lit Delete	Load Save Add default server
, D	✓ Name		Abstract
	- Hume	Geoserver.Cesga.es	Servicios WMS del CESGA
i + · 1	Puertos	Puertos	
÷ 3 ∓ 5	Raja Year 2003 Raja Year 2004	Predicción de la biomasa y de los hábitats idóneos de la raya radiada (Amblyraja radiate). Año 2003 Predicción de la biomasa y de los hábitats idóneos de la raya radiada (Amblyraja radiate). Año 2004	Los datos de biomasa de la raya radiada (Amblyraja radiate) fueron recogidos en el periodo 2003-2014 durante las campañas científi Los datos de biomasa de la raya radiada (Amblyraja radiate) fueron recogidos en el periodo 2003-2014 durante las campañas científi
÷ 7	Raja Year 2005	Predicción de la biomasa y de los hábitats idóneos de la raya radiada (Amblyraja radiate). Año 2004	Los datos de biomasa de la raya radiada (Ambyraja radiate) fueron recogidos en el periodo 2003-2014 durante las campañas científi.
÷ 9	Raja Year 2006	Predicción de la biomasa y de los hábitats idóneos de la raya radiada (Amblyraja radiate). Año 2006	Los datos de biomasa de la raya radiada (Amblyraja radiate) fueron recogidos en el periodo 2003-2014 durante las campañas científi.
⊕ 11 ⊕ 13	Raja Year 2007 Raja Year 2008	Predicción de la biomasa y de los hábitats idóneos de la raya radiada (Amblyraja radiate). Año 2007 Predicción de la biomasa y de los hábitats idóneos de la raya radiada (Amblyraja radiate). Año 2008	Los datos de biomasa de la raya radiada (Amblyraja radiate) fueron recogidos en el periodo 2003-2014 durante las campañas científi Los datos de biomasa de la raya radiada (Amblyraja radiate) fueron recogidos en el periodo 2003-2014 durante las campañas científi
	Raja Year 2009	Predicción de la biomasa y de los hábitats idóneos de la raya radiada (Ambiyraja radiate). Año 2000 Predicción de la biomasa y de los hábitats idóneos de la raya radiada (Ambiyraja radiate). Año 2009	Los datos de bornasa de la raya radiada (Ambiyaja radiate) fueron recogidos en el periodo 2003-2014 durante las campañas científi.
	Raja Year 2010	Predicción de la biomasa y de los hábitats idóneos de la raya radiada (Amblyraja radiate). Año 2010	Los datos de biomasa de la raya radiada (Amblyraja radiate) fueron recogidos en el periodo 2003-2014 durante las campañas científi
19	Raja Year 2011	Predicción de la biomasa y de los hábitats idóneos de la raya radiada (Amblyraja radiate). Año 2011	Los datos de biomasa de la raya radiada (Amblyraja radiate) fueron recogidos en el periodo 2003-2014 durante las campañas científi.
 € 21 € 23 	Raja Year 2012 Raja Year 2013	Predicción de la biomasa y de los hábitats idóneos de la raya radiada (Amblyraja radiate). Año 2012 Predicción de la biomasa y de los hábitats idóneos de la raya radiada (Amblyraja radiate). Año 2013	Los datos de biomasa de la raya radiada (Amblyraja radiate) fueron recogidos en el periodo 2003-2014 durante las campañas científi Los datos de biomasa de la raya radiada (Amblyraja radiate) fueron recogidos en el periodo 2003-2014 durante las campañas científi
± 25	Raja Year 2013 Raja Year 2014	Predicción de la biomasa y de los hábitats idóneos de la raya radiada (Ambiyraja radiate). Año 2013 Predicción de la biomasa y de los hábitats idóneos de la raya radiada (Ambiyraja radiate). Año 2014	Los datos de biomasa de la raya radiada (Ambiyraja radiate) fueron recogidos en el periodo 2003-2014 durante las campañas cientín
÷ 27	Year 2001	Predicción reclutas de cigala (Nephrops norvegicus). Año 2001	Predicción de los hábitat idóneos para los reclutas de cigala (Nephrops norvegicus) en el banco de Porcupine durante el periodo 200.
+ 29	Year 2002	Predicción reclutas de cigala (Nephrops norvegicus). Año 2002	Predicción de los hábitat idóneos para los reclutas de cigala (Nephrops norvegicus) en el banco de Porcupine durante el periodo 200.
31	Year 2003 Year 2004	Predicción reclutas de cigala (Nephrops norvegicus). Año 2003 Predicción reclutas de cigala (Nephrops norvegicus). Año 2004	Predicción de los hábitat idóneos para los reclutas de cigala (Nephrops norvegicus) en el banco de Porcupine durante el periodo 200.
	Year 2004 Year 2009	Predicción reclutas de cigala (Nephrops norvegicus). Ano 2004 Predicción reclutas de cigala (Nephrops norvegicus). Año 2009	Predicción de los hábitat idóneos para los reclutas de cigala (Nephrops norvegicus) en el banco de Porcupine durante el periodo 200. Predicción de los hábitat idóneos para los reclutas de cigala (Nephrops norvegicus) en el banco de Porcupine durante el periodo 200.
+ 37	Year 2010	Predicción reclutas de cigala (Nephrops norvegicus). Año 2010	Predicción de los hábitat idóneos para los reclutas de cigala (Nephrops norvegicus) en el banco de Porcupine durante el periodo 200.
· 39	Year 2011	Predicción reclutas de cigala (Nephrops norvegicus). Año 2011	Predicción de los hábitat idóneos para los reclutas de cigala (Nephrops norvegicus) en el banco de Porcupine durante el periodo 200.
	Year 2012 Year 2013	Predicción reclutas de cigala (Nephrops norvegicus). Año 2012 Predicción reclutas de cigala (Nephrops norvegicus). Año 2013	Predicción de los hábitat idóneos para los reclutas de cigala (Nephrops norvegicus) en el banco de Porcupine durante el periodo 200. Predicción de los hábitat idóneos para los reclutas de cigala (Nephrops norvegicus) en el banco de Porcupine durante el periodo 200.
± 43 	Year 2013 Year 2014	Predicción reclutas de cigala (Nephrops norvegicus). Año 2013 Predicción reclutas de cigala (Nephrops norvegicus). Año 2014	Predicción de los nabitat idoneos para los reclutas de cigala (Nephrops norvegicus) en el banco de Porcupine durante el periodo 200. Predicción de los hábitat idóneos para los reclutas de cigala (Nephrops norvegicus) en el banco de Porcupine durante el periodo 200.
÷ 47	Year 2015	Predicción reclutas de cigala (Nephrops norvegicus). Año 2015	Predicción de los hábitat idóneos para los reclutas de cigala (Nephrops norvegicus) en el banco de Porcupine durante el periodo 200.
😟 49	cigala_predAllYear	Predicción reclutas de cigala (Nephrops norvegicus). Año 2001-2015	Predicción de los hábitat idóneos para los reclutas de cigala (Nephrops norvegicus) en el banco de Porcupine durante el periodo 200.
€ 51 € 53	haul ices_areas_2	haul_back ices_areas_2	
± 55	mod_flemish_cap	Predicción de los hábitats idóneos del pennatuláceo Anthoptilum sp. en Flemish Cap. 2007-2017	Los datos ocurrencia del pennatuláceo Anthoptilum sp. fueron recogidos en el periodo 2007-2017 durante las campañas científicas d.
+ 57	mod_pred_abunall	Predicción de la biomasa y de los hábitats idóneos de la raya radiada (Amblyraja radiate). Año 2003-2014	Los datos de biomasa de la raya radiada (Amblyraja radiate) fueron recogidos en el periodo 2003-2014 durante las campañas científi
	nafo_areas	nafo_areas	Delimitaciones de áreas NAFO
+ 61 + 63	predicc_4326 socio raster	predicc_4326 socio_raster	
÷ 65	vw_hauling	iSEAS_hauling	Datos de lances del provecto ISEAS. Demo
mage encoding	I		
PNG O	PNG8 🔿 JPEG 🔿 GIF	O TIFF O SVG	
ptions (0 coor	dinate reference systems	available)	
File size			
Feature limit f	or GetFeatureInfo		10
			Change
Use conte	ctual WMS Legend		
name			
			Add X Close He

The information layers that are enabled for the connection from QGIS are available. We select the information layers and add them to a QGIS map.





In this example, the prediction of biomass and suitable habitats of the radiata ray (Amblyraia radiate) was loaded for the year 2003.

As an example of access to restricted data through the user and role access policy, we have the following link, through which we can access private data of specific captures:

http://iseas.cesga.es:8080/geoser	ver/ISEAS/wms	
Users, Groups, and Roles Manage user group and role services Servicios Users/Groups Roles		
default Añadir nuevo usuario Eliminar los seleccionados Eliminar los seleccionados y sus asociaciones de rol		Edit Suscar
Nombre de usuario	Habilitado	Tiene atributos
🔲 admin	✓	
armador	×	
D publico	A.	
serveradmin	4	
socio	✓	
<< < 1 > >> Resultados 1 a 5 (de un total de 5 ítems)		
 Agregar nuevo grupo Eliminar los seleccionados 		
Eliminar los seleccionados y eliminar las asociaciones de roles		
		٩
Nombre del grupo		اهر Habilitado
Nombre del grupo <		

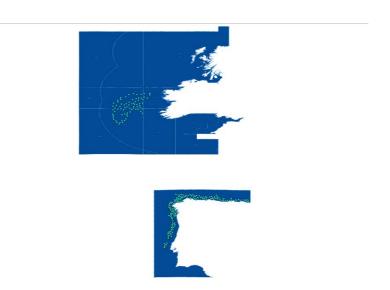
6.2. WFS service

• The Web Feature Service (WFS) service allows access to a web service of phenomena and remote access and editing of geographical data. It is done at the geographic object level, that is obtaining the elements one by one, being able to access its information. This standard allows remote access to the attributes of a specific geographic object. Within the LIFE ISEAS project, WFS services have been implemented to securely query the vector data of hauls with user and



password control, in the same way that we can do it with WMS services. The link to which we can access the WFS services is

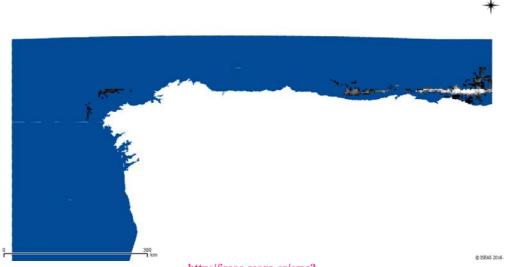
• <u>http://iseas.cesga.es:8080/geoserver/ISEAS/wfs</u>



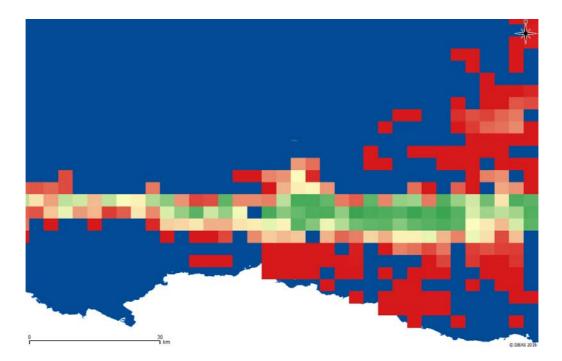
6.3. WCS service

The Web Service Coverage Service (WCS) allows the obtaining of geospatial data in the form of coverage or raster, which has access to the thematic attribute of the pixels that do not have to be RGB colors as in the case of the WMS standard, but any value thematic. In the case of the LIFE iSEAS project, a WCS service has been implemented that will allow access to the results of the models. While waiting for these results, tests have been carried out with results of the models obtained with data from the iSEAS Faros project. They will be used with the iSEAS data when they are available from task B3.





http://iseas.cesga.es/ows?





ISEAS

6.4. WPS service

Implementation of the WPS service

The WPS standard provides rules for the standardization of input and output (requests and responses) for geospatial processing services.

The OGC® Web Processing Service (WPS) standard describes how to access geospatial processes from a Web interface. The processes cover any algorithm, calculation or model that operate on georeferenced raster or vector data. A WPS can present calculations as simple as a subtraction between two sets of georeferenced numbers, subtracting one from another (e.g., determining the difference in the results of a model at two different times).

The WPS processes are divided into three categories: vector, raster and geometry; making reference to the type of geospatial content used as input to the process. These categories are broad, since they can take multiple types of entry.

As proof we have proposed the cutout of the model that we have served as WCS that indicates the suitability of the fishing zones, with polygons of known coordinates in WKT format.

Within the processes available in Geoserver we have one available that is ras: cropCoverage, which allows us to cut a raster using a geometry as a cut layer. The configuration of the process in Geoserver is as follows:





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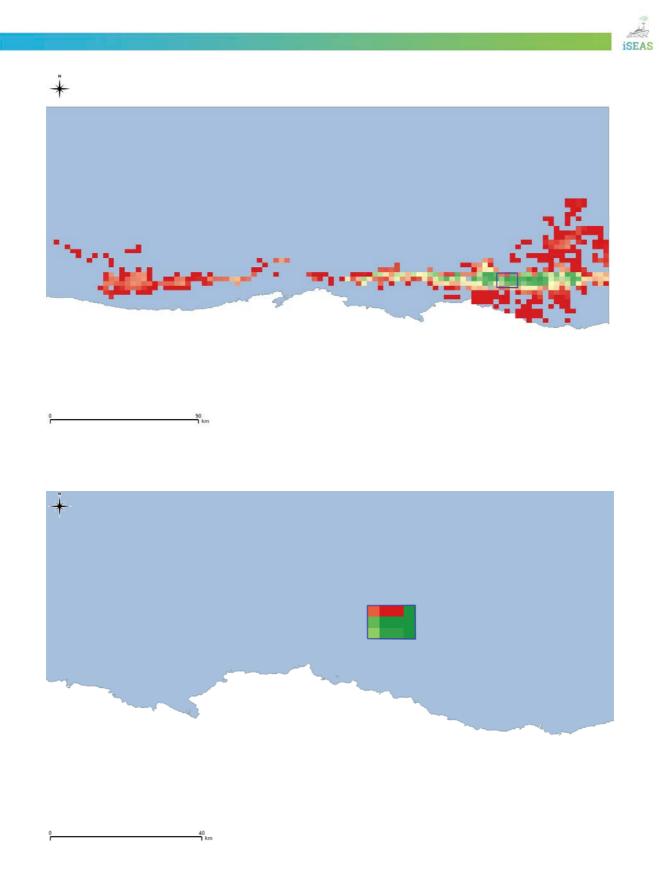
	iSEA
Generador de consultas WPS paso a paso.	
Elija proceso	
ras:CropCoverage	
Returns the portion of a raster bounded by a given geometry. (Proces de descripción WPS)	
Entradas para el proceso	
coverage* - GridCoverage2D	
Input raster	
RASTER_LAYER V ISEAS:socio_raster V	
cropShape* - Geometry	
Geometry used to crop the raster	
TEXT application/wkt	
Polygon ((-2.61157447 43.59392553, -2.61123404 43.5161383, -2.49753191	
43.51460638, -2.4987234 43.59460638, -2.61123404 43.5161363, -2.49753191	
Salidas del proceso	
result* - GridCoverage2D	
Cropped raster	
Generate image/tiff	
Autentificación	
🔲 identificar (de otro modo se ejecutará la solicitud como anónima)	
Ejecute el proceso Generar XML de los procesos entrada/salida	

This type of processing can be controlled by user selection and password.

CSIC CESCA opromar®

The result in this case is a layer in raster format (tiff image) with the result of the cut made by those coordinates.





The process executes the trim of the result of the model that we have used that indicates the suitability of the fishing zones, with polygons of known coordinates in WKT format. The result of the WPS process is an image in geotiff format that can be downloaded in the client part.



6.5. CSW service

Implementation of the CSW catalog service

The catalog service (CSW) allows the publication and search of the description (metadata) of data and web services, through a standard interoperable communication protocol that transmits the requests between client and server. Through this service it is possible to access and consult all available geographic resources.

TER	Q Web Services 🖶 Data Available Inform advanced centure V	Sorby Readice 😿 🖬 🖬 💷 1 Souchet - Ober actions -	BUCENT
A A A A A A A A A A A A A A A A A A A	E SEAN WHIS Service in ISO19139/139 The same average average in the standard area of the service from the access to the standard area of the services (with, with weak, with, with, with, with, standard weak, of the services (with, with, with) with, with, standard with a service (with, with, with) weak, with, standard weak, of the services (with, with, weak, with, standard weak, of the services (with, with, weak, weak, weak, of the services (with, with, weak, weak, of the services (with, with, weak, of the services (with, with, weak, of the services (with, with, weak, of the services (with, weak, of the services (with, weak, of the services (with, with, weak, of the services (with, with, weak, of the services (with, weak, of the se	*****	ISEAS WHS service in ISO39339/119
	Shaadarri	Schemar 10772	
			PREVIEW

Metadata catalog



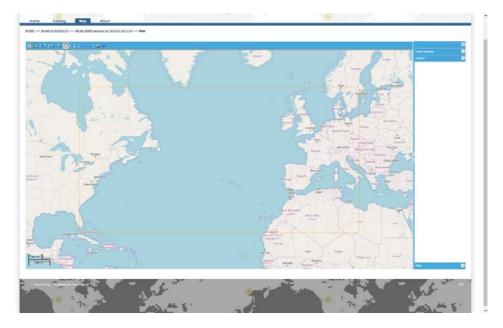
SEAS

	GeoNetwork	
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me Catalog Map Abo	out	
>> <u>SEARCH RESULTS</u> >> ISEAS WHS service i	n IS019129/119	
ev mode - Actions -		a 🗩 📂 🔶
SEAS WMS service in ISO	19139/119	
he service presents the results on fishing discar	rds that have been achieved in the ISEAS project.	Logo
he ISO19139/119 metadata standard is the pre	derred metadata standard	
o use for services (WHS, WFS, WCS).		
* *		
nformation about the dataset		
Reference date	2018-06-30712.00:00 (Revision: Date identifies when the resource was examined or re-examined and improved or amended)	
Keywords	WFS, WMS, GEOSERVER, GEONETWORK, OSGeo (Theme)	
Keywords	ISEAS (Theme)	
ontact information		
hint of contact	Ionfolded anses Emilia Adapt Vindi Organization annes (Edita) Facilian e manes Tricnico Edit Vidoo 2001 S10010 Otto 2001 S10010 Otto 2001 S1005 Control control S10705 Control S10705 Control S10705 Control S10705	
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echnical information		
Uneape	Statement. The information is generated from the execution of fishery resource estimation execution models	

Metadata of iSEAS services

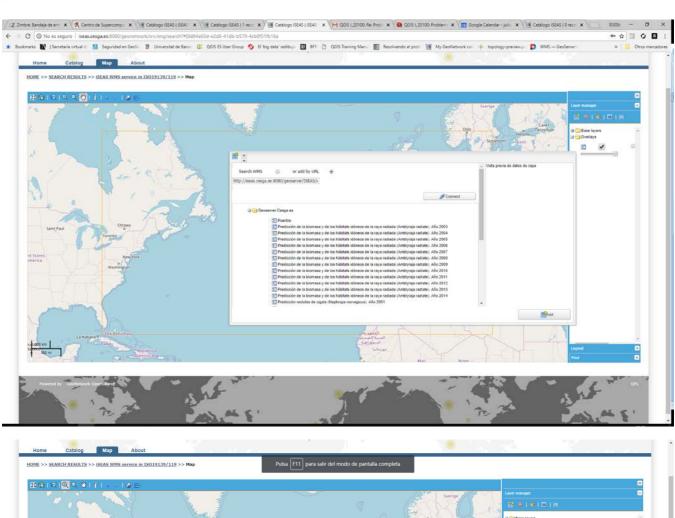
In the catalog service we find the metadata of the services displayed with the contact information, metadata and reference of the technical information

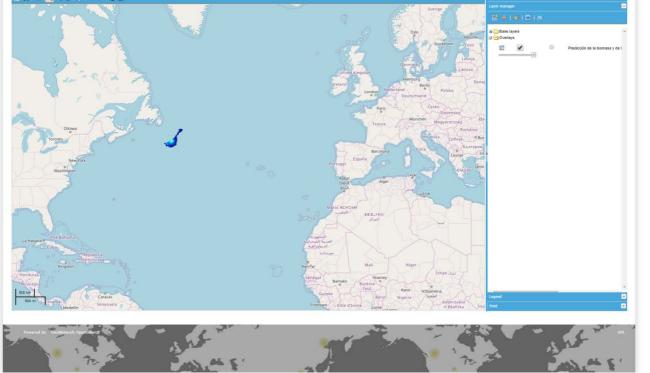
From the catalog itself you can access a webmap, from which you can load the services displayed.





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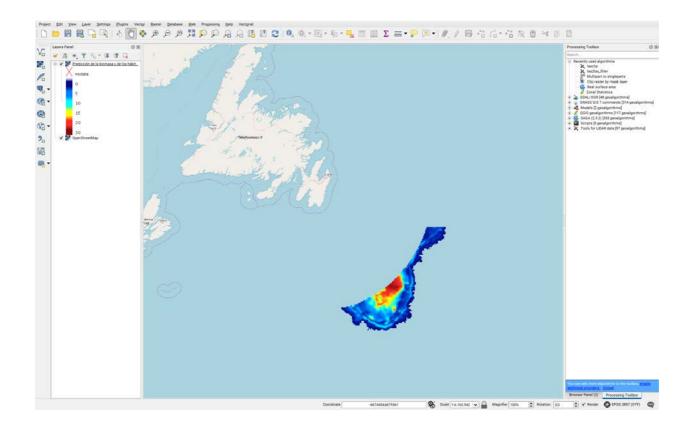


•



The different services are also accessible from a Geographical Information System, in the following example we can see the load of one of the services, for which the following tasks were necessary:

- The results of the prediction models of the radiata ray species, of the Pennatulacean Anthoptilum sp. in Flemish Cap., and of the ideal habitats for Nephrops conscripts. These models correspond to general models and calculations for different years. These layers have been prepared for inclusion within geoserver and served through the WMS geovisor and public services.
- The layers of information have been optimized to achieve greater performance in the availability of the layers, by creating pyramids and layering the layers at different levels.
- They have also created their own symbologies for each of the species, taking into account their inter-annual graduation and each year independently.





7. Presentations and congresses

"SDI to improve Efficiente Fishing: LIFE iSEAS Project". Presentation at the INSPIRE 2017 conference. September 2017 Strasbourg, France



INSPIRE 2017







"Implementation of an SDI in the LIFE iSEAS project". VIII Iberian Conference on Spatial Data Infrastructures. November 2017. Lisbon, Portugal







OTAIleres JOSMAR, S.L.



"Innovative tools for the management and reduction of Fishing Discards". Presentation at CESGA. February 2018.



"Spatial Data Infraestructure technologies applied in LIFE iSEAS project to improve Efficient Fishing". MARTEC18, May 2018.









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