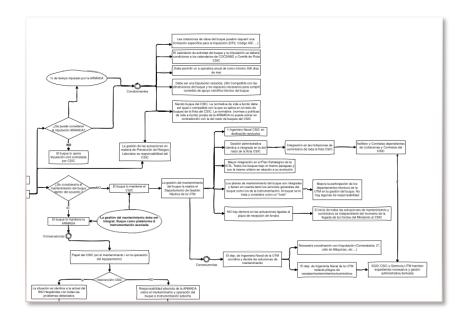


### Spanish fleet strategic plan: What's next ...

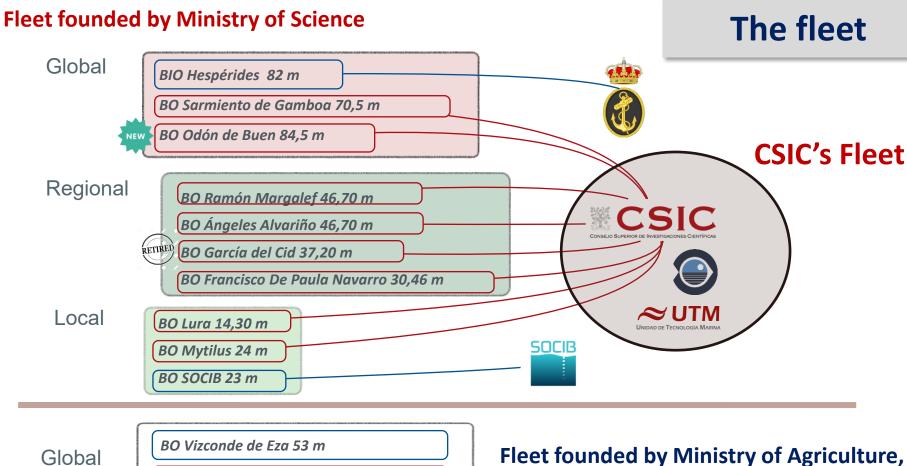






#### Framework

- Strategic Plan of the CSIC Fleet (vessels, facilities, equipment and organization, in line with PE infrastructures-general CSIC)
- Strategic Plan for all Ministry of Science vessels
  - January-February 2025
  - Investment plan and possibility of access to European derivatives funds
  - that may have an impact on the strategy of the CSIC fleet (e.g. replacement of the BIO Hespérides)



BO Miguel Oliver 70 m

**Fisheries and Food** 

### The fleet

vessel	leng th	launching	Date of retirement	Age at retirement	Current age	Time for retirement	status
BO Miguel Oliver	70,00	2006	2041	35	18	17	half-life
BO Vizconde de Eza	53,00	2000	2035	35	24	11	active
BIO Hespérides	82,50	1990	2030	40	34	6	near to be retired
BO Sarmiento de Gamboa	70,50	2006	2041	35	18	17	half-life
BO Ramón Margalef	46,70	2011	2046	35	13	22	active
BO Angeles Alvarino	46,70	2012	2047	35	12	23	active
BO Francisco De Paula Navarro	30,46	1984	2028	45	40	5	near to be retired
BO Garcia del Cid	37,20	1979	2024	45			retired
BO Lura	14,30	1981	2025	45	43	2	near to be retired
BO Mytilus	24,00	1996	2031	35	28	7	near to be retired

#### Premises for the strategy

- To initiate the Strategic Plan with an analysis of past and current experience of use, the future prospects of researchers and technicians, and international benchmarks for the future of marine research.
- Look for technical solutions once the needs of use are clearly defined. Separate phases and not think of solutions in advance.
- Evaluate costs and priorities based on economic availability and urgency in adopting solutions.
- Have an external vision and guidance throughout the process that eliminates as far as possible the biases of vision that we may have.
- Align objectives and solutions with the respective frameworks in terms of strategic plans.
   (CSIC and Ministry Fleet ).

BO Cornide de Saavedra

**Total general** 

	10 00 00 00	11 30111293
Vessel	sea	
BO Miguel Oliver	2.713	126
BO Ramón Margalef	2.288	234
BO Vizconde de Eza	2.052	83
BO Angeles Alvarino	2.003	202
BO Sarmiento de Gamboa	1.785	81
BO Hespérides	976	37
BO Francisco De Paula Navarro	731	56
BO Garcia del Cid	609	69
BO Lura	564	558
BO Jose Maria Navaz	325	185
BO Mytilus	242	172
BO Volandeira	44	44

Nº days at

14

14.346

Nº surveys

1.848

### Fleet usage analysis

Vessel	1 día	1 semana	2 semanas	mas de 2 semanas
BO Lura	553	5		
BO Ramón Margalef	14	99	67	54
BO Angeles Alvarino	11	59	95	37
BO Jose Maria Navaz	64	121		
BO Mytilus	138	32	2	
BO Miguel Oliver		2	40	84
BO Vizconde de Eza		3	13	67
BO Sarmiento de Gamboa		6	19	56
BO Garcia del Cid	3	25	30	11
BO Francisco De Paula Navarro	3	14	15	24
BO Volandeira	44			
BO Hespérides		1	3	33
BO Cornide de Saavedra			1	

### Fleet usage analysis

Fleet Users (Surveys promoted by...)

	Nº	Days	% in nº of surveys	% in days
IEO National Center - CSIC	849	4.969	60,26 %	54,02 %
Marine Research Institutes - CSIC	172	1.935	12,21 %	21,04 %
National Universities	132	1.102	9,37 %	11,98 %
Regional Administrations	213	546	15,12 %	5,94 %
National Ministries & Administrations	13	358	0,92 %	3,89 %
International Research Organizations	8	109	0,57 %	1,19 %
National Private Entities	5	84	0,35 %	0,91 %
Other National Research Entities	14	57	0,99 %	0,62 %
Other International Research Entities	3	38	0,21 %	0,41 %

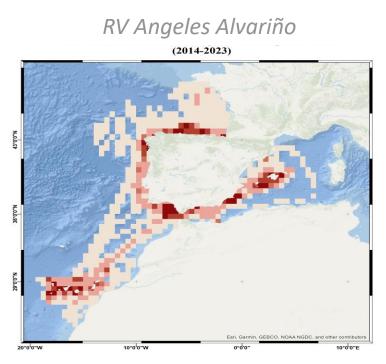
Туре	days	N∘	
1 day	722	722	
1 week	866	241	
2 weeks	2.429	231	
More than 2 w	5.181	215	

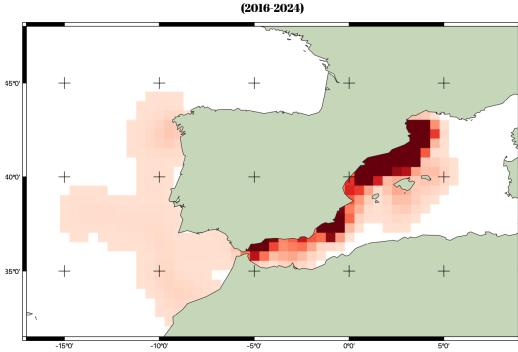
Ships	Days	Surveys
BO Ramón Margalef	2.288	234
BO Angeles Alvarino	2.003	202
BO Sarmiento de Gamboa	1.785	81
BO Hespérides	976	37
BO Francisco De Paula Navarro	731	56
BO Garcia del Cid	609	69
BO Lura	564	558
BO Mytilus	242	172
Total general	9.198	1.409

### Fleet usage analysis

Most visited locations for Regional Vessels

RV García del Cid

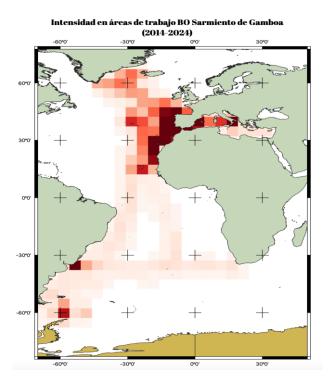




### Most visited locations for Global

### Vessels

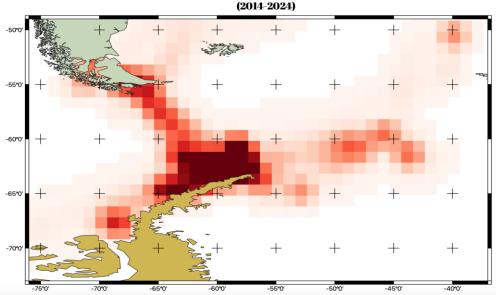
#### RV Sarmiento de Gamboa



### Fleet usage analysis

#### RV Hespérides

#### Intensidad en áreas de trabajo BIO Hespérides



### Fleet usage analysis

The analysis of the data offered by the "surveys metadata" offers very interesting information to "capture" aspects of the current use of the fleet (how much, who and where) but lacks sufficient depth for an analysis of future perspective or detectable gaps in the current use of the vessels:

- 1. A more in-depth analysis of the "typology" of the campaigns is required (scope of marine domains, specialty, duration, techniques, etc.))
- 2. Identify future needs
- 3. Identify gaps (equipment, access, support, ...)

#### **DIRECT CONSULTATION WITH USERS**

### **Extended Analysis**

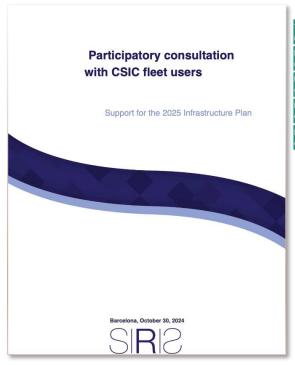
#### **Premises:**

- 1. Seeking the best representativeness of the group consulted
- 2. Have external support in carrying out the consultation to avoid internal bias and increase the trust and confidence of the consulted group ("expertise" in the scientific & marine field)
- 3. Have an additional external view in the first analysis of results

Hire an external consultant with expertise in research infrastructures and research strategic plans

### **Extended Analysis**

#### Hire an external consultant









**SIRIS** Academic is a European strategic consulting, research and development company that designs, supports the implementation and evaluates institutional strategies and and public policy solutions in the field of higher education, research, innovation and territorial development







### **Extended Analysis**

Define the current uses and future needs of the users of the ships of the CSIC Fleet avoiding the material "wish list" effect (focused in use cases: tell me- what, how, where...)

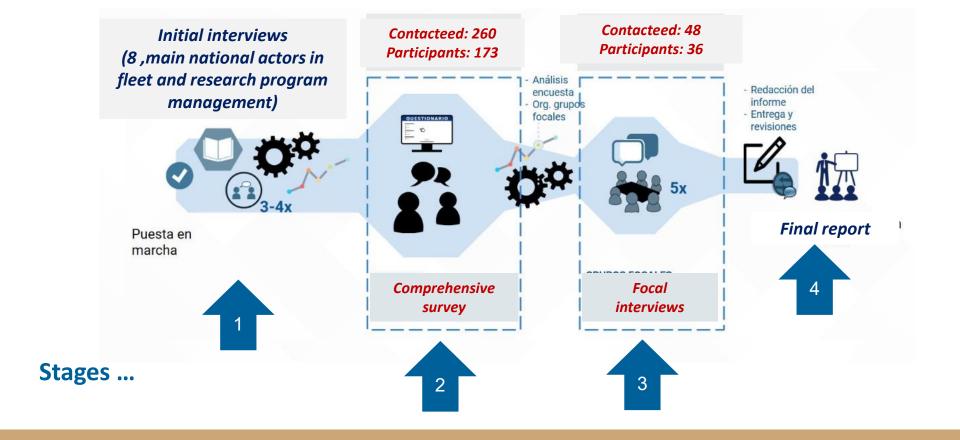
The survey is built around 3 major themes (+ questions from contextualization)

- Needs and uses related to operational scope (focusing on the duration and geography
  of sampling areas)
- 2. Needs and uses related to the study conditions (e.g. depth of sampling, techniques, formations, etc..)
- 3. Needs related to functional issues (e.g. level of satisfaction of the CSIC fleet in various areas)

A very extensive survey on the use of vessels by users and their future prospects regarding work areas, length of surveus, depth ranges, personnel needs, technical support, techniques employed, and instrumentation.

#### SCOPE ...

#### **Extended Analysis**



### **Extended Analysis**

Diversity of institutions, even beyond the CSIC

An inclusive scope to have the greatest representativeness of the diversity of fleet user profiles

Scientific and technical profiles

- Gender diversity
- Juniors and Seniors
- Various disciplines and type of research (competitive and commissions)
- We start from the base of the population of researchers capable of leading/planning campaigns that appeared to us in the previous analysis of the metadata.
- We add a list of suggested by the Directors of the Research Institutes and the National Center & Suggestions Marine Program Manager

	Institution	Number of contacted	%
	CEAB	1	
	IACT	12	
	IATS	1	
	ICM	42	
CSIC Institutions	ICMAN	6	91.5%
CSIC Institutions	IDAEA	4	91.5%
	IEO	146	
	IGME	9	
	IIM	9	
	IMEDEA	8	
	UCM	1	
	ULPGC	3	
	UMA	1	
	UIB	1	
	UB	6	
Non-CSIC institutions	UCADIZ	3	8.5%
	UNIOVI	1	
	USAL	1	
	UVigo		
	AZTI	1	
	Grand Total	260	100.00%

#### **Extended Analysis**

- The Spanish fleet is primarily local and regional. The volume of operations in the western Mediterranean basin, the northeastern Atlantic and the peninsular seas stands out.
- The geographic areas of emerging interest include: the Indo-Pacific, the Pacific coast (Chile, California), the African Atlantic coast, the eastern Mediterranean basin, the Caribbean Sea, and the Arctic.
- The CSIC fleet's "prototype" survey is coastal and of long duration. This indicates that the priority type
  of vessel to cover the needs of a greater volume of users is a coastal/regional vessel with good
  capacity to operate in the open sea and a desirable autonomy of more than two weeks.
- Most respondents sail with less than one day of transit, which highlights the importance of the territorial and port of departure component, as well as the optimization of transits. 20% of respondents who do not currently embark on regional and global campaigns (two or more days of transit) would like to be able to do so.
- Regional infrastructure needs require a good balance of manoeuvrability and stability to cover areas from 50m to 2000m depth.

### **Extended Analysis**

- The Spanish fleet is primarily local and regional. The volume of operations in the western Mediterranean basin, the northeastern Atlantic and the peninsular seas stands out.
- There is a perceived risk of losing Spanish competitiveness in polar campaigns in the medium term due to: a) the ageing of the BIO Hespérides, b) the reduction of global campaign days and the impact in terms of meeting objectives and range of action, c) the lack of access to crucial areas for the study of climate change.
- The saturation of the regional vessels BO Margalef and BO Alvariño generates a chain logistical impact that affects the work of the BO Sarmiento de Gamboa
- The general perception is of greater satisfaction with global capabilities than with coastal and regional capabilities, although navigation is missed in some regions, among which the Indo-Pacific region stands out.

### **Extended Analysis**

- Looking at the future demand for **instruments**, it is noteworthy that:
  - The most frequently used equipment (extractive and sensors) are well covered, with some increase in demand expected;
  - There is a growing demand for the use of image-based techniques both from the community that currently uses them and from those who do not yet;
  - the community that uses acoustic and seismic prospecting methods expects some increase in demand.
  - Significant emerging needs in remote sensing and molecular material collection are identified by new research communities;
  - Fishing gear will maintain a stable level of needs, with a very defined community of use...

### **Extended Analysis**

- Beyond the availability of instruments, relevant limitations of use are detected:
  - a) breakdowns, calibration errors, deterioration, poor maintenance of sensors,
  - b) problems with the length, resistance and/or orientation of cables for the deployment of robotic vehicles at maximum depth, and
  - c) limitations of on-board processing generated by the lack of clean rooms, gas extraction hoods and insufficient cooling capacity.
- Among the techniques and equipment that are not yet in widespread use but generate a lot of
  interest among CSIC fleet users, the most notable are AUVs, in situ pumps for collecting samples in the
  water column (sedimentation, benthopelagic coupling, suspended particles) and deep sea sampling
  methods greater than 10 m lenght.

### **Extended Analysis**

Observation instruments	118	Yes, and the I will need more forward	No	No, but I think that the I will need	Answers totals
Extractive methods (e.g. dredges, sleds, corers, etc.) except those related to fishing	115	19	31	11	176
Fishing gear	66	6	98	6	176
Autonomous physical-chemical sensors (eg. buoys, floats, CTD, air quality sensors etc.)	121	24	23	8	176
Techniques based on image and observation direct (e.g. video camera, photogrammetry, ROVs, etc.)	67	24	56	29	176
Seismic prospecting methods	29	11	131	5	176
Acoustic methods (e.g. sonar, echo sounder, hydrophones, etc.)	77	14	74	11	176
Remote sensing and remote sensing methods (e.g. satellites, drones, etc.)	37	14	94	31	176
Methods for collecting material molecular (e.g. environmental DNA, RNA, etc.)	43	17	87	29	176

### **Extended Analysis**

- A pressing need for at least one medium-sized regional vessel, with the following ideal:
  - a) smaller size than the current regional ones (BO Alvariño/B Margalef) but with good coverage
  - b) A vessel to be able to cope with adverse conditions in the open sea, especially if it is to operate in the Atlantic (ideal: gunwale capable of withstanding waves of 1.5-3m)
  - c) sufficient space for scientific teams of **at least 12 people**, a key point for being able to cover multidisciplinary and fishing surveys;
  - d) with high stability and silent dynamic positioning;
- Design of future vessels considering variables of:
  - a) strategic balance between infrastructure versatility and specialization,
  - b) Overcoming operational limitations in the use of instruments used on board and structural design conditions.

### **Extended Analysis**

#### **MAIN CONCLUSIONS**

 Maintain satisfaction with long-distance campaigns, facilitating as far as possible greater access to new users and monitoring the consequences of the future retirement of BIO Hespérides.

- Maximize the potential use of current equipment as a priority or in parallel with the acquisition of new instruments, with three key measures:
  - a) Review of calibration and maintenance protocols on equipment essential.
  - b) Publication of a common catalogue of existing vessels and instruments at national level.
  - c) Standardize and enhance the portfolio of technical support services.

#### **Next steps**



- 1. Beginning of reflection on the characteristics of a potential new local/regional vessel.
  - a) The user survey detects a need but difficult to decide what the profile of the ship will be.
  - b) A certain intention to avoid "multidisciplinarity"



2. Start of the specification phase of the replacement of the BIO Hesperides

#### **Key aspects**

### **BIO Hespérides Replacement**

- 1. Polar Vessel. PC6-PC7 with high logistic profile but present scientific features. Complementary to RV Odón de Buen and RV Sarmiento de Gamboa
- 2. 2025. General specification & exploitation model
- 3. 2026. Tender
- 4. 2027-2030 Construction
- 5. STEP technologies & sustainability solutions
- 6. Spanish Navy will "play a rol" but CSIC owning the vessel
  - Need to accommodate this and with available funding. (Design & exploitation model)

### **BIO Hespérides Replacement**

## Spanish Navy will "play de game" but CSIC owns the vessel ...

