



SPAIN

NATIONAL REPORT

**TO THE 12th MEETING
OF THE EASTERN ATLANTIC
HYDROGRAPHIC COMMISSION
(EAtHC)**

**LISBOA, PORTUGAL
14 - 16 NOVEMBER 2012**

1. Hydrographic Service

Instituto Hidrográfico de la Marina (IHM). There have not been any relevant modifications in the organization of our Hydrographic Service since the last meeting in 2010.

Information on the IHM mission, structure and assets can be found in the web site <http://www.armada.mde.es/ihm>.

This report covers the period from November 2010 to November 2012.

2. SURVEYS

2.1. Coverage of new surveys

In order to update our bathymetry and our national nautical chart scheme covering the Atlantic Ocean, IHM has planned and carried out a total of sixteen hydrographic campaigns in the last two years. The corresponding surveys were performed with our hydrographic vessels both in the north and west coasts of the Iberian Peninsula as well as in the Canary Islands: Six of them were carried out in the Gulf of Cadiz (west of the Strait of Gibraltar), nine in the North Coast, and one in the Canary Islands.



Figure 1. "Malaspina" class oceanic hydrographic vessel



Figure 2. "Antares" class coastal hydrographic vessel

IHM continued with its plan to survey all main harbours as well as their approaching channels by using detection means that yield full bottom coverage. For this purpose, IHM employs transportable hydrographic yachts carrying shallow water hull mounted multibeam echosounders, as well as hydrographic boats fitted with bathymetric interferometric sensors for very shallow waters.



Figure 3. Transportable hydrographic yacht



Figure 4. Very shallow water bathymetry system operated from a boat

Besides the surveys carried out to update our national nautical chart scheme, two campaigns were performed in the last two years as part of the Spanish Exclusive Economic Zone (EEZ) bathymetric survey plan. IHM has carried out this type of surveys since 1995. The Spanish Navy Oceanographic Research Vessel “Hespérides” is available one month every year for this purpose, and hydrographers from the IHM are deployed for those campaigns.



Figure 5. Spanish Navy Oceanographic Research Vessel "Hespérides"

At present, the hydrographic coverage of the Spanish EEZ in the Atlantic Ocean is approximately 50%.

In addition to the forementioned nautical charting and EEZ surveys, several hydrographic campaigns have been carried out during the period covered by this report, in the western area of the Canary Islands, which aimed to collect bathymetric and geophysical data to support the extension of the Spanish

Continental Platform in that area. Though the minimum depth in that area is about 4000 meters, the collected data are processed and stored in our hydrographic database to improve the quality of our charts.

Figures 6, 7, and 8 show coverage and quality of the hitherto collected bathymetric data in the areas of interest for the EAHC. The areas show coverage of charts belonging to the Spanish nautical chart scheme.

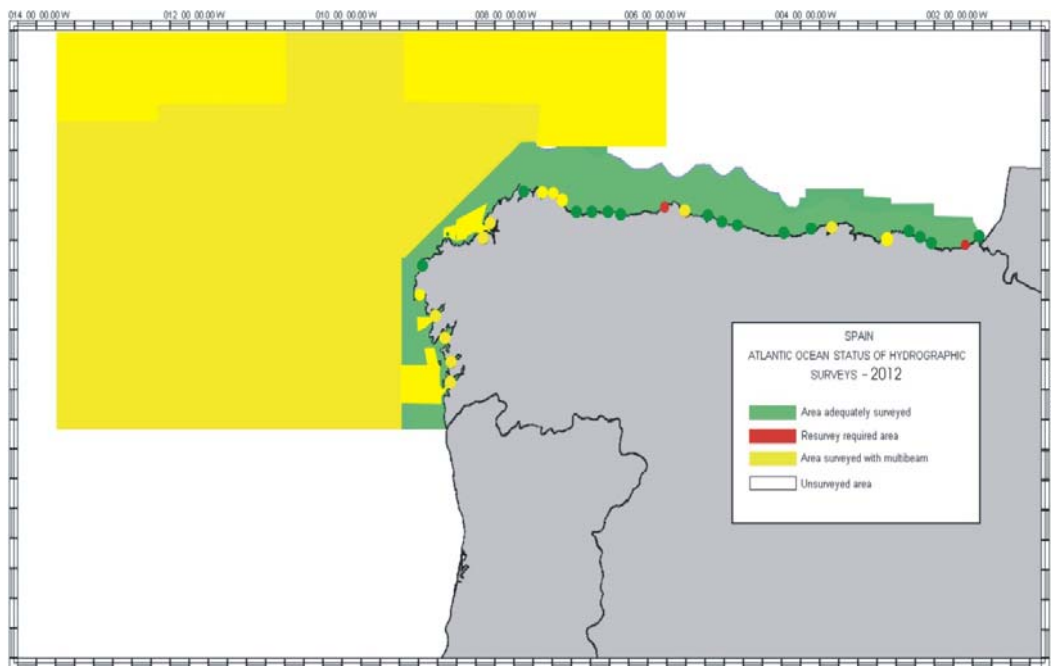


Figure 6. Status of hydrographic surveys N and NW of the Iberian Peninsula, until October 2012

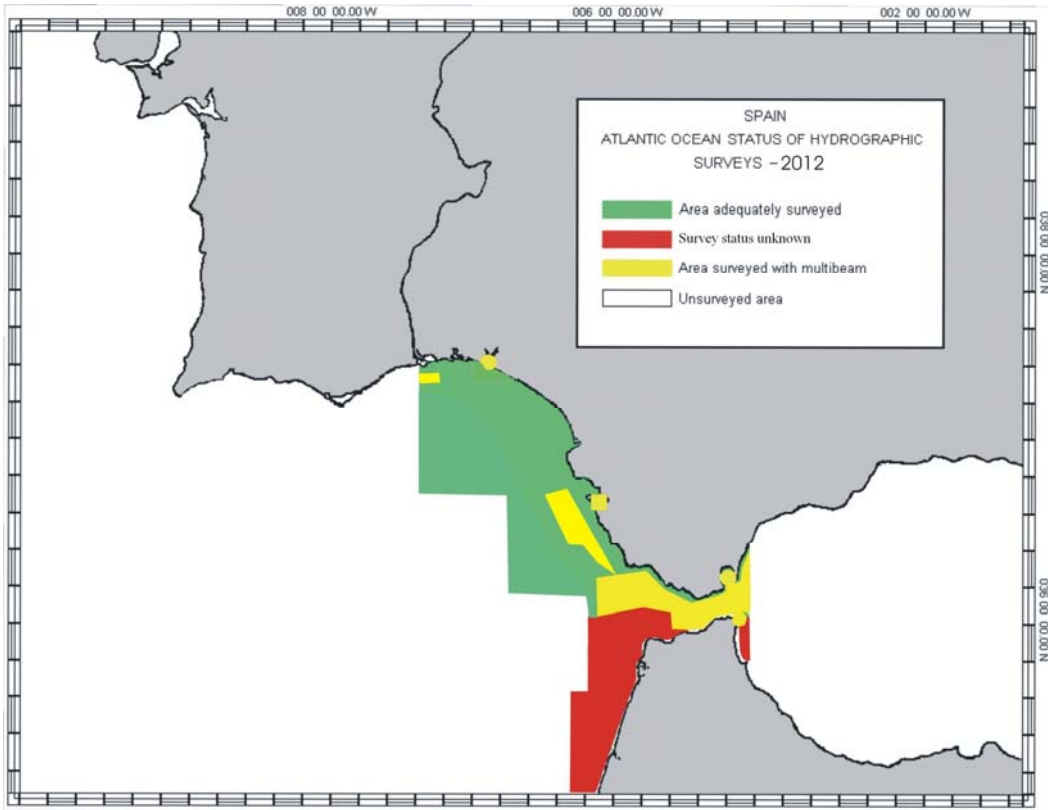


Figure 7. Status of hydrographic surveys S and SW of the Iberian Peninsula, until October 2012

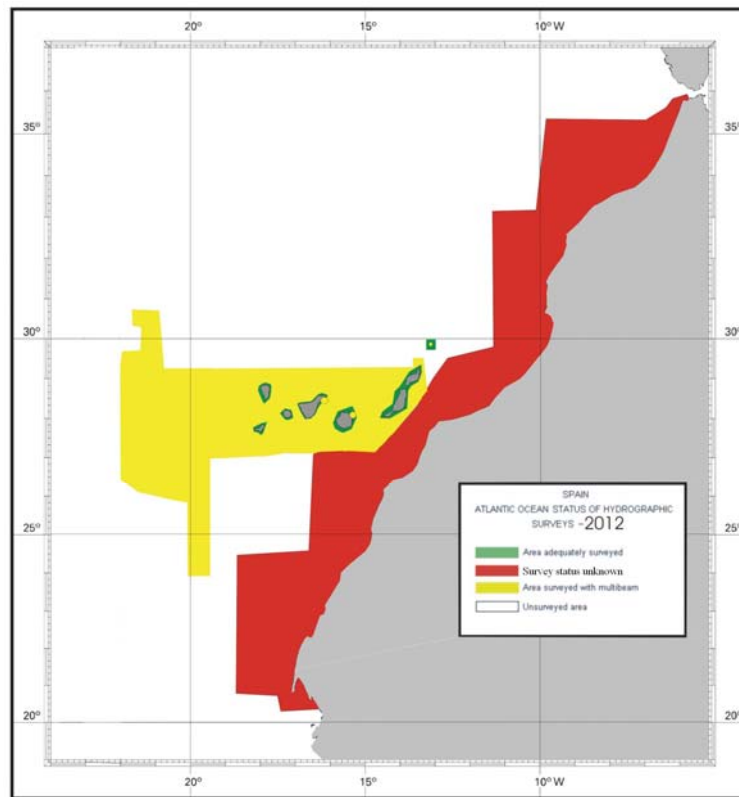


Figure 8. Status of hydrographic surveys, Canary Islands and NW Africa, until October 2012

Survey planning

All the surveys have been planned taking into account the type and purpose of each navigational area, in accordance with the IHO S-44 publication (4th and 5th editions). This requirement makes us assign specific surveys to our ships depending upon their hydrographic capability, equipment and endurance.

2.2. New technologies and / or equipment

The IHM started an equipment acquisition programme in 2010, supported by the Spanish Navy, which has resulted in a significant hydrographic capacity improvement.

2.2.1. Echosounders

By the end of 2011, both the oceanic hydrographic vessels “Tofiño” and “Malaspina” were fitted with single beam and multibeam echosounders. The latter worked in depths ranging from 100 to 5000 meters.

Since the beginning of 2012, the “Tofiño” is also fitted with a shallow water multibeam echosounder, which allows the carrying out of full bottom coverage surveys from shallow depths down to 5000 meters.

On the other hand, before 2012 the coastal hydrographic vessels “Antares” and “Rigel” were fitted only with single beam echosounders. In the beginning of 2012, a shallow water multibeam echosounder was mounted on the “Antares”, which allows full bottom coverage from shallow depths down to 400 meters.

During 2011, IHM acquired two portable bathymetric interferometric systems for very shallow waters ranging from 0 – 50 meters. These sensors can be deployed from small boats, thus allowing full bottom coverage in areas very close to the coast where a larger ship would not be possible to operate. With this capacity, the requirements for IHO special order surveys can be met.

As the hardware has been upgraded, the software has been improved accordingly. The software now being used is capable of handling the tasks of data acquisition, processing, and managing. This new software allows, for example, the display of the bathymetric data over an ENC or an ortophoto while carrying out the survey.

2.2.2. Bottom mapping sonars

The IHM bottom mapping capability has also benefited from the acquisition of new equipment. On one hand, a synthetic aperture sonar was mounted

on one of the vessels. This sonar yields very good resolution and wide surveying swaths, enhancing the efficiency of the surveys. This sonar will be used to ensure full bottom exploration of harbour channels and anchoring areas, whose features might not be detected by bathymetric echosounders.

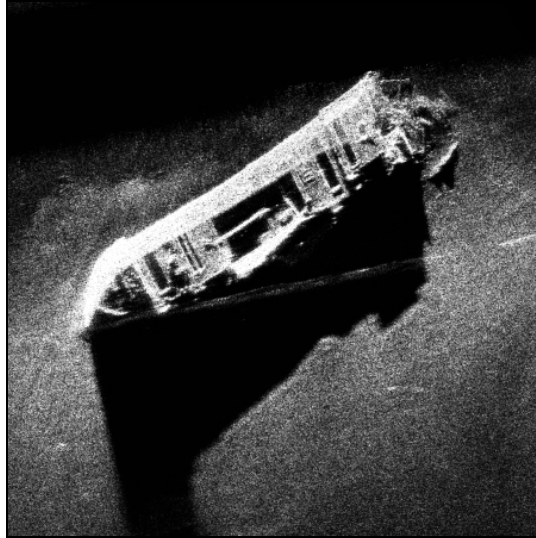


Figure 9. Wreck image obtained with the synthetic aperture sonar

On the other hand, a very fine resolution sidescan sonar has also been acquired, with the capability of operating alongside a magnetometer. This sonar can be deployed from either a hydrographic vessel or from one of the hydrographic yachts.

In order to cover very shallow water areas with sidescan sonar, three of these have been acquired that can be operated from hydrographic boats. Working simultaneously with echosounders, these sidescan sonars will enable IHO special order surveys.

Finally, in order to have more assets available to carry out hydrographic surveys, as well as to optimize the use of public resources by different administrations, some agreements and arrangements are in the process of being signed between the Spanish Navy and several State agencies with competences in the marine environment, which operate platforms with multibeam echosounders. These agreements will consider the use of those platforms to obtain bathymetric data according with IHO standards, to feed the IHM database.

2.3. New Ships

The two “Antares” class coastal hydrographic vessels will need to be replaced in the near future. There are currently two projects under development to build newer vessels, but due to the current financial situation it is not known when the building of those vessels will take place.

2.4. Problems encountered

NTR.

3. NEW CHARTS & UPDATES

3.1. ENCs

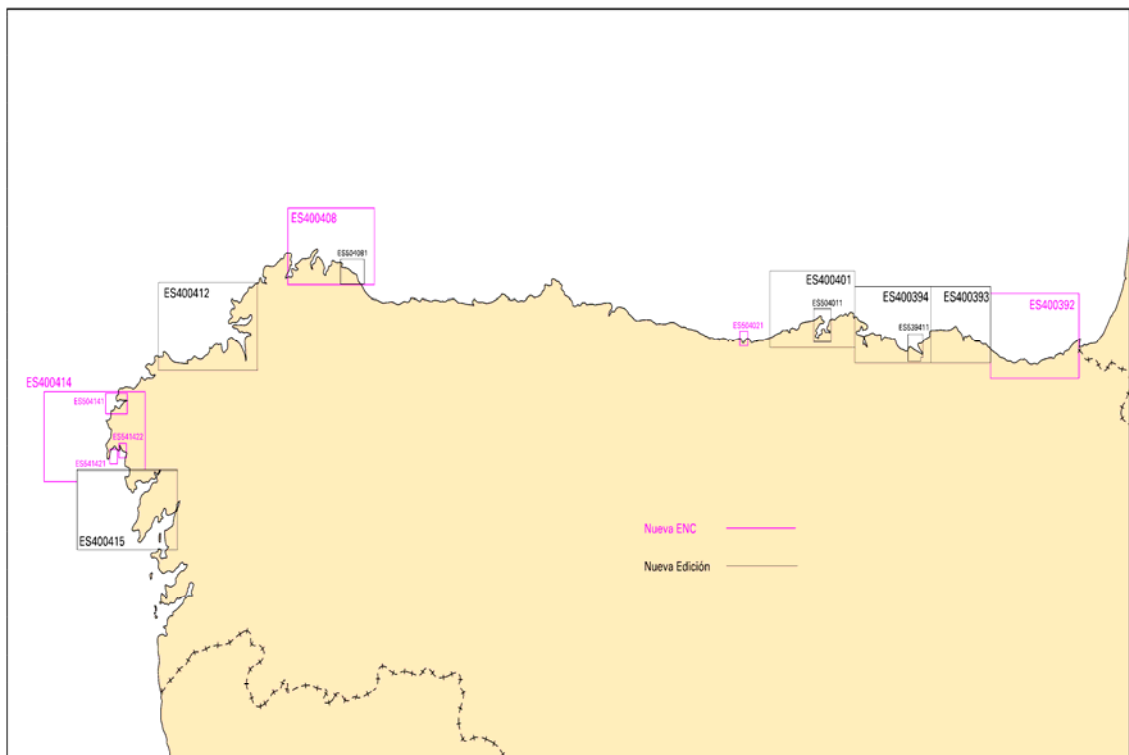
3.1.1. Production

At present, the IHM has produced 72 ENCs within the area of the EAthC (out of a total of 134 published for all areas). Table 1 shows the distribution according to their navigational purpose:

Purpose 2 General	Purpose 3 Coastal	Purpose 4 Approach	Purpose 5 Harbour
4	11	25	32

Table 1. Distribution of ENC production in the EAthC area

Since the date of the last meeting 11 new ENCs, 23 new editions and 506 updates have been produced within the EAthC area. This shows the increasing workload associated with maintaining and updating the ENC catalog, which slows the production of new ENCs.



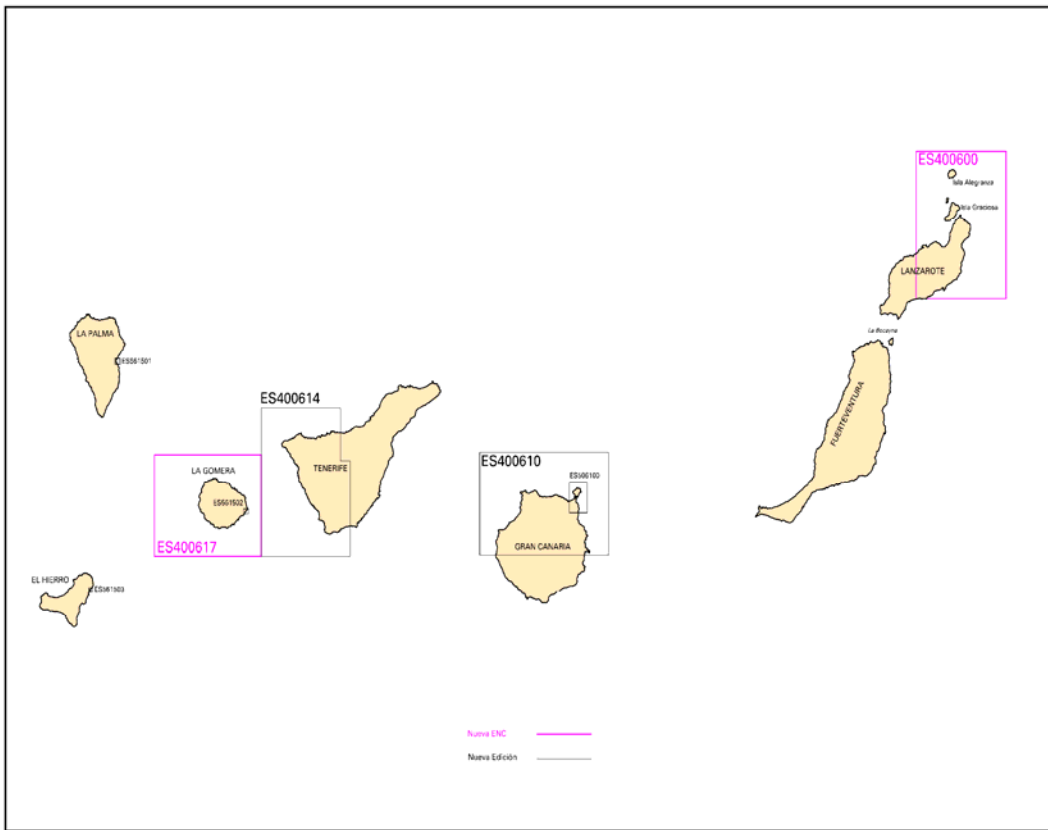
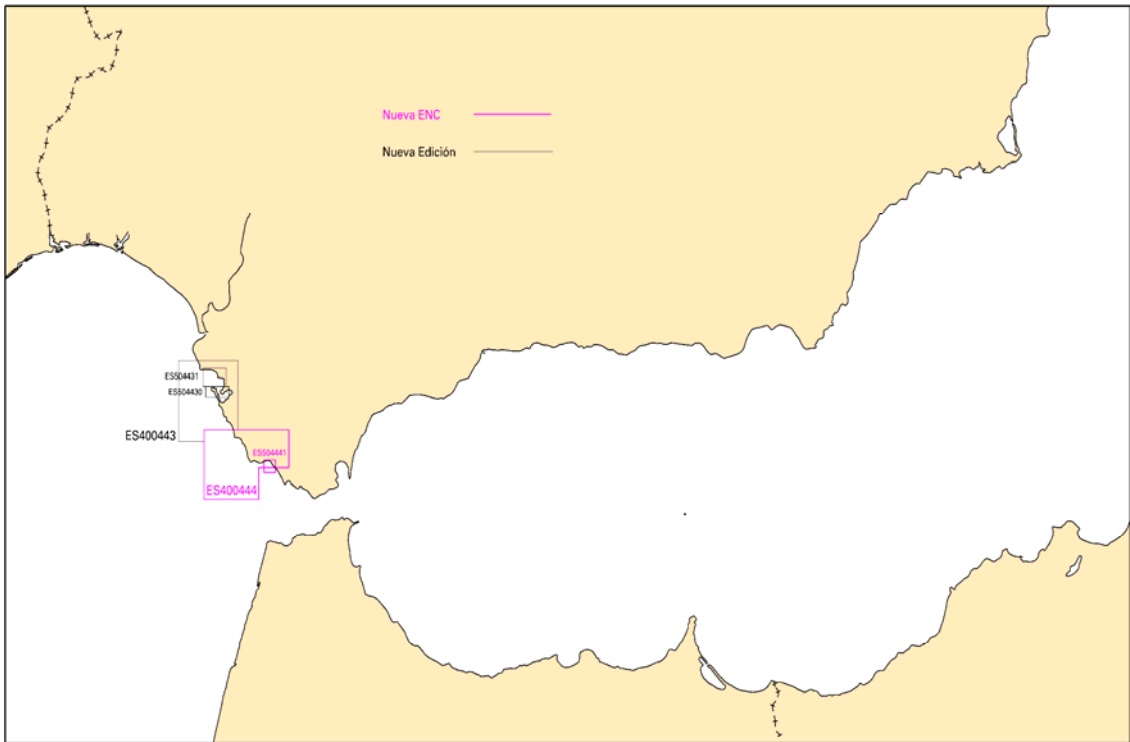


Figure 10. New ENC cells and editions produced since the date of the last EAthC meeting (purposes 4 and 5)

The ENC coverage for purposes 4 and 5 has had a 16% and 5% increase respectively since the date of the last meeting. A further 34% and 66% increase respectively is needed to fulfill the 100% coverage for those purpose bands.

Figure 11 shows that Spanish ENC coverage for small and medium scales, purposes 2 and 3, within the EAtHC area is complete.

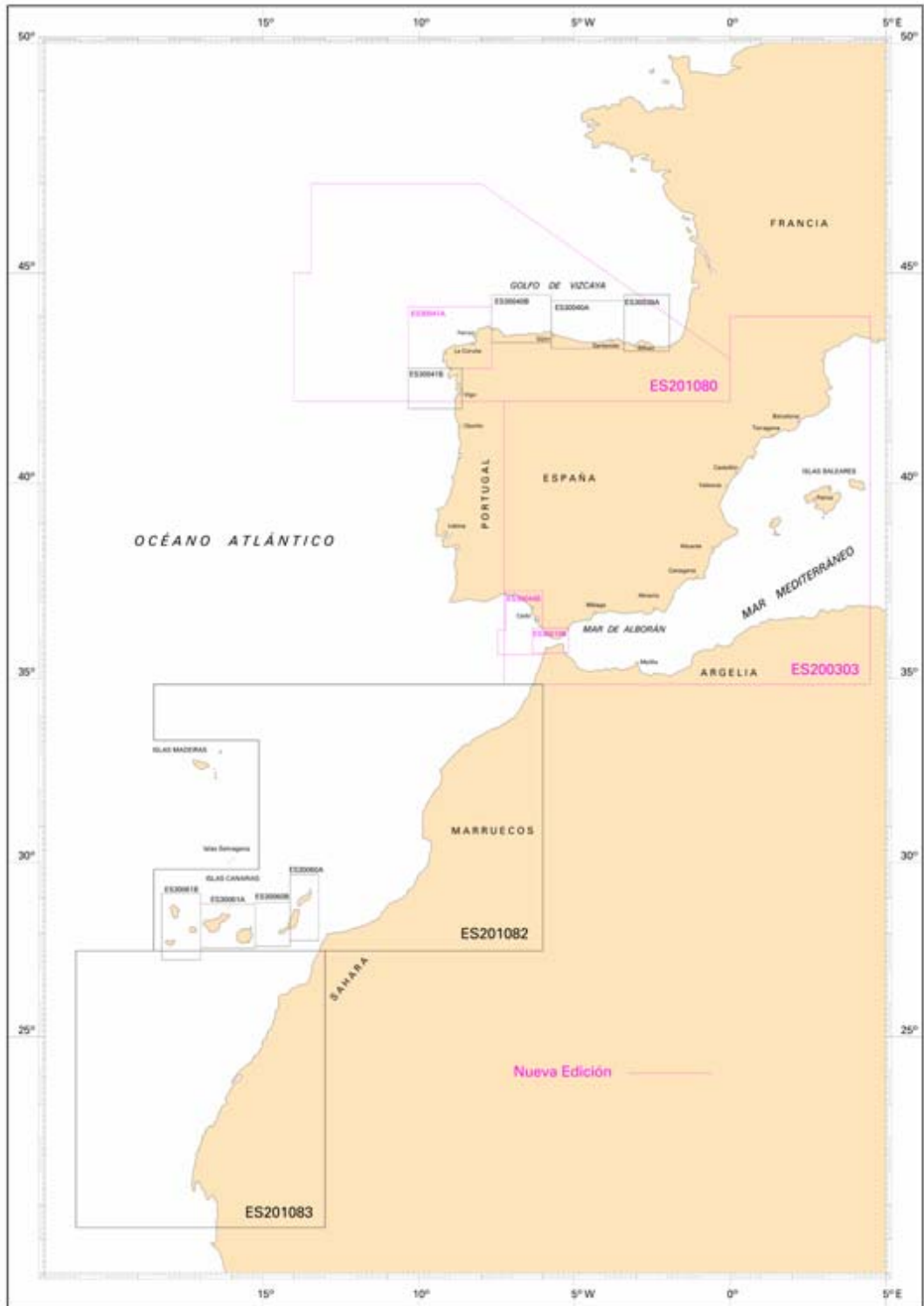


Figure 11. Complete small and medium scale ENC coverage (purposes 2 and 3)

3.1.2. Cooperation

Under the cooperation with the IC-ENC and PRIMAR RENCs, IHM continues to exchange all the ENC information needed with Portugal (IHPT) and France (SHOM) in order to comply with the IHO recommendations regarding horizontal and vertical consistency on the adjacent ENC (in the boundaries between national waters)

3.2. ENC Distribution method

IHM is a member of the IC-ENC RENC, which carries out ENC validation and consistency checking before distribution, and distributes the ENCs via its chain of Value Added Resellers (VARs).

3.3 RNCs

NTR.

3.4 INT paper charts

Table 2 shows the new INTernational paper charts / editions within the EAthC published since the date of the last meeting. These are either new charts (NC) or new editions (NE).

NUM (INT)	SCALE	TITLE
6100 (INT 1928)(NE)	1/12.500	Puerto de Las Palmas
44B (INT 1819) (NE)	1/175.000	De isla Canela a cabo Trafalgar
84 (INT 1938) (NC)	1/375.000	De Sidi Ifni a cabo Yubi e islas de Lanzarote y Fuerteventura
83 (INT 1937) (NC)	1/3.500.000	De cabo Safi a Sidi Ifni

Table 2. INTernational paper charts published since the date of the last EAthC meeting

3.5 National paper charts

NUM	SCALE	TITLE
415C (NE)	1/25.000	Ría de Arousa
443 (NE)	1/50.000	De Chipiona a puerto de Conil
4125 (NE)	1/15.000	Ría de Ares y Betanzos
2B (NC)	1/1.500.000	Península Ibérica
414 (NE)	1/ 60.000	De cabo Villano a punta Remedios
404 ^a (NE)	1/25.000	Aproches de Gijón
1 (NE)	1/12.000.000	Océano Atlántico Norte
416B (NE)	1/25.000	Ría de Vigo
394A (NE)	1/25.000	Aproches de Bilbao
416A (NE)	1/25.000	Ría de Pontevedra
405A (NE)	1/25.000	Aproches de la ría de Avilés
404 (NE)	1/50.000	De cabo Lastres a cabo de Peñas
405 (NE)	1/50.000	De cabo de San Lorenzo a cabo Vidio.
416 (NE)	1/60.000	De la península de O Grove a cabo Silleiro
6 (INT 103 FR) (NC)	1/3.500.000	Del canal de la Mancha al estrecho de Gibraltar y archipiélago de las Azores
43C (INT 1817 PT) (NE)	1/150.000	De cabo de Sines a Lagos
42 (INT1810 PT) (NE)	1/350.000	De cabo Silleiro a cabo Carvoeiro

Table 3. National paper charts published since the date of the last EAHC meeting

Since the date of the last meeting, within the area of the EAthC, a number of national paper charts have been published. These are new charts (NC) or new editions (NE). These charts are either produced from national data or adopted from charts produced by other Hydrographic Offices). All of them are shown in Table 3.

3.6. Other charts (leisure charts)

Table 4 shows the leisure charts published since the date of the last meeting. These are new charts with a new format, to be used mainly by leisure / sports navigators.

NUM	SCALE	TITLE
D443	1/50.000	De Chipiona a cabo Roche
D440	1/50.000	Río Guadiana a río Piedras

Table 4. Leisure charts published since the date of the last meeting

3.7. Problems encountered

Even though the Spanish catalogue lists nautical charts covering part of the western African coast, no systematic surveys have been carried out by IHM in that area for decades, except for soundings of opportunity when vessels transit between the Iberian Peninsula and the Canary Islands. Therefore, no data are available for IHM to publish up-to-date editions of the existing charts.

4. NEW PUBLICATIONS AND UPDATES

4.1. New publications

NTR.

4.2. Updated publications

- *Catalog of Nautical Charts and other publications*, 2011 edition.

- IHO S-4 associated publication *INT 1 – Symbols, Abbreviations and Terms use on Charts (Spanish version)*, 4th edition 2011.
- *List of lights and fog signals, part I*, 2012 edition. Coasts of Spain and Portugal on the Atlantic Ocean, Africa West Coast from Cabo Espartel to Cape Verde (Senegal), Azores Islands, Madeira, Canary Islands and Cape Verde.
- *List of lights and fog signals, part II*, 2012 edition. Gibraltar Strait, Balearic Islands and Mediterranean coasts of Spain, Morocco and Algeria.
- *Sailing Directions num. 2 volume I*, 2012 edition. North West Coast of Spain from Estaca de Bares to Rio Miño.
- *Sailing Directions num. 2 volume II*, 2012 edition. Coasts of Portugal and South West Spain, from Rio Miño to Trafalgar.
- *Supplement num. 1 (2012) to Sailing Directions num. 3, volume I*, 2010 edition. North and South coasts of the Strait of Gibraltar.
- *Supplement num. 1 (2011) to Sailing Directions num. 1*, 2008 edition. North Coast of Spain, from the Rio Bidasoa to the Estaca de Bares.
- *International Regulations for the Preventing Collisions at Sea (1972)*, 2012 edition.

4.3. Means of delivery.

A digital version of the publication *List of Lights and Fog Signals* is currently available online (an interactive internet tool) in the following internet address:

http://www.armada.mde.es/i hm /Aplicaciones/LibroFaros/LF_iquery/index.html

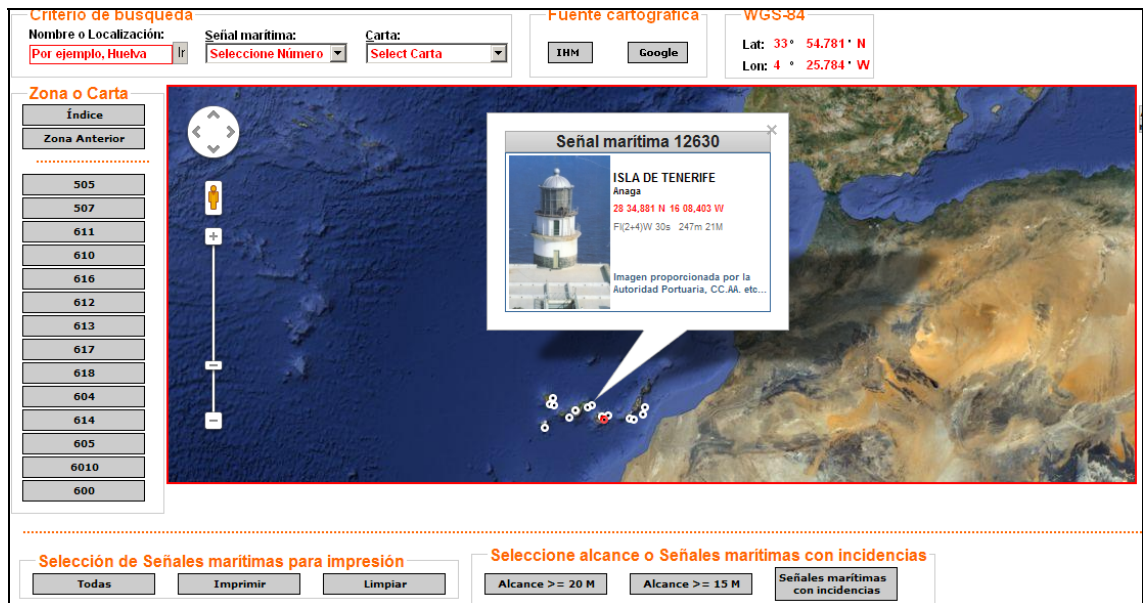


Figure 12. Screenshot of the List of Lights and Fog Signals interactive tool

4.4. Problems encountered.

NTR.

5. MSI

Spain is NAVAREA III (Mediterranean and Black Sea) Coordinator.

5.1. Existing Infrastructures for transmission

The current situation of the dissemination of Maritime Safety Information can be summarized as follows:

5.1.1. Radio Navigational Warnings

Coordinator: SASEMAR (Spanish National Agency for Maritime Search and Rescue Operations, Ministry of Public Works) is the national Coordinator for coastal and local radio navigational warnings. The National Rescue Coordination Centre (CNCS) is located in Madrid.

Means: NAVTEX Stations.
MF and VHF Stations.

There are three Spanish NAVTEX stations broadcasting in the NAVAREA II region: La Coruña (NW Iberian Peninsula), Tarifa (Strait of Gibraltar), and Las Palmas (Canary Islands). They broadcast in English and Spanish.

Any information considered by IHM as relevant for vessels in transit to the NAVAREA II Region and French coastal waters, is submitted via FAX to SHOM (NAVAREA II Coordinator); likewise, SHOM and CECMED (Commander in Chief and District Commander Mediterranean French Naval) report any maritime safety information affecting Spanish coastal waters and NAVAREA III area of coverage. Thus, there is a fluid exchange of information between both Coordinators.

Likewise, if IHM has knowledge of any event affecting Maritime Safety in waters under jurisdiction of some other country within NAVAREA II region, both the relevant country and the NAVAREA II Coordinator are duly informed.

5.1.2. SAR Organisation

Coordinator: SASEMAR through its National Centre (CNCS) and its Area, Regional and Local Centres.

Means: NAVTEX stations and communication stations at SASEMAR Centres, as well as coastal MF and VHF stations.

5.2. New infrastructure in accordance with GMDSS Master Plan

NTR.

5.3. Problems encountered.

NTR.

6. C-55

6.1. SPAIN. CHARTING REGION G

Information valid as of 01 October 2012.

6.1.1. HYDROGRAPHIC SURVEYING

Survey coverage, where:

A = percentage which is adequately surveyed.

B = percentage which requires re-survey at larger scale or to modern standards.

C = percentage which has never been systematically surveyed.

	A	B	C
Dephts < 200 m	94	6	0
Dephts > 200 m	50	0	50

6.1.2. NAUTICAL CHARTING

Status of nautical charting within the limits of the EEZ

A = percentage covered by INT series, or a paper chart series meeting the standards in M-4.

B = percentage covered by Raster Navigational Charts (RNCs) meeting the standards in S-61.

C = percentage covered by ENC's meeting the standards in S-57.

Purpose/ scale	A	B	C
Offshore passage/ Small	100	0	100
Landfall and Coastal passage/ Medium	100	0	100
Approches and Ports/ Large	100	0	50

Regarding to ENC large scale coverage is important to notice that current percentage (50%) has been calculated over the new ENC production project, which aims to cover all national main and secondary ports.

6.1.3. MARITIME SAFETY INFORMATION (MSI).

NAVIGATIONAL INFORMATION (S-53)

SERVICE	Yes	No	Partial	Notes
LOCAL WARNINGS	X			
COASTAL WARNINGS	X			
NAVAREA WARNINGS	X			Via NAVAREA II Coordinator
PORT INFORMATION	X			Agreements with all Port Authorities

GMDSS IMPLEMENTATION (IMO Publication 970–GMDSS Manual)

SERVICE	Yes	No	Partial	Notes
Master Plan	X			
Area A1	X			
Area A2	X			
Area A3	X			
NAVTEX	X			
SafetyNET	X			For NAVAREA Warnings only.

6.2. SPAIN. CANARY ISLANDS, CHARTING REGION G

Information valid as of 01 October 2012.

6.2.1. HYDROGRAPHIC SURVEYING

A = percentage which is adequately surveyed.

B = percentage which requires re-survey at larger scale or to modern standards.

C = percentage which has never been systematically surveyed.

	A	B	C
Dephts < 200 m	95	5	0
Dephts > 200 m	44	0	56

6.2.2. NAUTICAL CHARTING

Status of nautical charting within the limits of the EEZ

A = percentage covered by INT series, or a paper chart series meeting the standards in M-4.

B = percentage covered by Raster Navigational Charts (RNCs) meeting the standards in S-61.

C = percentage covered by ENC's meeting the standards in S-57.

Purpose/ scale	A	B	C
Offshore passage/ Small	100	0	100
Landfall and Coastal passage/ Medium	100	0	100
Approches and Ports/ Large	100	0	50

Regarding to ENC large scale coverage is important to notice that current percentage (50%) has been calculated over the new ENC production project, which aims to cover all national main and secondary ports.

6.2.3. MARITIME SAFETY INFORMATION (MSI).

NAVIGATIONAL INFORMATION (S-53)

SERVICE	Yes	No	Partial	Notes
LOCAL WARNINGS	X			
COASTAL WARNINGS	X			
NAVAREA WARNINGS	X			Vía NAVAREA II Coordinator
PORT INFORMATION	X			Agreements with all Port Authorities

GMDSS IMPLEMENTATION (IMO Publication 970–GMDSS Manual)

SERVICE	Yes	No	Partial	Notes
Master Plan	X			
Area A1	X			
Area A2	X			
Area A3	X			
NAVTEX	X			
SafetyNET	X			Via NAVAREA II Coordinator

7. Capacity Building

7.1. Offer of and/or demand for Capacity Building

The Spanish Hydrographic School, located within the premises of the IHM, offers both Category A and B IHO/FIG/ICA hydrography courses. These courses are 10 month long and are taught in Spanish language. Minimum academic enrolling requirements should be fulfilled.

The following is a list of the students who have attended these courses in the last three academic years:

Category A course:

Academic year 2011-2012

2 Officers from the Spanish Navy
1 Officer from Guatemala

Academic year 2010-2011

2 Officers from the Spanish Navy
1 Officer from Argentina
1 Officer from Honduras

Academic year 2009-2010

4 Officers from the Spanish Navy
1 Officer from the Dominican Republic
1 Officer from Morocco
1 Officer from Tunisia

Category B course:

Academic year 2011-2012

1 Petty Officer from the Spanish Navy
1 Petty Officer from the Dominican Republic

Academic year 2010-2011

2 Petty Officers from the Spanish Navy
1 Petty Officer from the Dominican Republic

Academic year 2009-2010

1 Petty officer from the Spanish Navy.

For the time being, all the students are military personnel. The attendance of non-Spanish students is offered through a *Collaboration Agreement with regard to military training*, signed between the Spanish Ministry of Defence and other countries. This agreement provides grants for the attendance to the abovementioned courses.

The point of contact for these matters is generally the Defence Attaché to the corresponding Spanish Embassy.

7.2. Training received, needed, offered

NTR.

7.3. Status of national, bilateral, multilateral or regional development projects with hydrographic component. (In progress, planned, under evaluation or study)

Talks are in progress between IHM and a national university, to agree on setting up the basis a “master in hydrography”, which would follow the line of the currently taught Hydrography Category A course.

7.4. Definition of bids to IHOCBC

NTR.

8. Oceanographic activities

8.1. General

An upgraded IHM database is under construction and is being populated by tidal data collected from all national harbours. Users will be able to access this database in the future via the Internet.

Also, all the available information about bottom composition types is being georeferenced and vectorized to be accessible for GIS applications, and complement nautical cartography.

8.2. GEBCO/IBC's activities

NTR.

8.3. Tide gauge network

Five radar tide gauges have been recently acquired by IHM, fitted with meteorological sensors and real time transmission capability, which will be deployed as long-term stations at locations not covered by the current national tide gauge network. Once these gauges are deployed, their data will be shared with the other national institutions which take part in the national network.

Information regarding to the Spanish tide gauge network can be found at the following IHO web link:

http://www.iho-ohi.net/mtg_docs/com_wg/IHOTC/IHOTC_Misc/TideGaugeInventory.pdf

8.4. Problems encountered

The current tidal data database has limited access, which does not allow to operatively analyze the data. This is the reason why an upgraded database is under construction. This database should allow interaction with web applications.

9. Other activities

9.1. Participation in IHO Working Groups

IHM takes part in several committees and working groups of the IHO:

- Hydrographic Services and Standards Committee (HSSC)
- Standardization of Nautical Publications Working Group (SNPWG)
- Chart Standardization and Paper Chart Working Group (CSPCWG)
- Tidal and Water Level Working Group (TWLWG)
- Hydrographic Commission on Antarctica (HCA)
- East Atlantic Hydrographic Commission (EAtHC)
- Mediterranean and Black Sea Hydrographic Commission (MBSHC)
- World-Wide Navigational Warning Service Sub-Committee (WWNWS)
- Finance Committee (FC) (since 2012)
- Staff Regulations Working Group (SRWG) (since 2012)

9.2. Meteorological data collection

The recently acquired tide gauges integrate meteorological sensors, whose records can be transmitted in real time to IHM.

9.3. MSDI Progress

Within the framework of the national Spatial Data Infraestructure concept, some digital information has been sent to the Central Cartographic Registry of Spain, including Spain's updated coastline on a scale 1:50000.

Also within the SDI framework, IHM takes part in a working group on Spain's SDI (IDEE in Spanish), which aims to integrate via the Internet all data, metadata, services and any other geographical information produced in Spain, so that all potential users be able to locate, identify, select, and access such resources through the SDI geoportal (<http://www.idee.es>).

Likewise, a geographic web portal within the Ministry of Defence is under construction, which will represent its SDI portal. IHM takes part in this project, and is currently elaborating a metadata database.