



NATIONAL REPORT

**TO THE 21th MEETING
OF THE MEDITERRANEAN AND BLACK
SEAS HYDROGRAPHIC COMMISSION
(MBSHC-21)**

**CADIZ, ESPAÑA (SPAIN)
11 to 13 JUNE 2019**

**Instituto Hidrográfico de la Marina
Cádiz - España**

1. HYDROGRAPHIC SERVICE

Instituto Hidrográfico de la Marina (España). There haven't been relevant internal modifications in the organization of our Hydrographic Service since the last meeting. Our organization, mission and different kind of services offered can be found at <http://www.armada.mde.es> (http://www.armada.mde.es/ArmadaPortal/page/Portal/ArmadaEspañola/ciencia_ihm_1/prefLang_es/).

This report covers the period May 2017 – May 2019.

2. SURVEYS

2.1. Bathymetric coverage of new surveys

A total of 99% of Spanish Mediterranean coastal waters up to 200 m deep have already been surveyed. These data were updated considering single beam coastal surveys (<200 m) as complying adequately with S-44 standards. However, for this report, only multi beam surveys have been considered: 40% of Spanish Mediterranean coastal waters up to 200 m deep have already been surveyed. The current effort is focused on resurveying by multi beam the single beam coastal surveys (<200 m).

For the period covered by this report, the Spanish Hydrographic Office has conducted a total of twelve hydrographic surveys by using either Multibeam Echosounders (MBES) or Interferometric Sonar (Phase Differencing Bathymetric Sonars PDBS). These surveys were performed by our hydrographic vessels in the Alboran Sea and south and east coast of Spain.



Figure 1. "Malaspina" class oceanic hydrographic vessel.



Figure 2. "Malaspina" class oceanic hydrographic vessel, A-32 "Tofiño" in Monaco.



Figure 3. "Antares" class coastal hydrographic vessel.

Furthermore, it is important to highlight that this office has continued with the goal of carrying out hydrographic surveys of Ports and their approaching channels (Special order surveys). For this purpose, IHM employed transportable hydrographic launches fitted with MBES as well as small boats fitted with PDBS.



Figure 4. Transportable hydrographic launches.



Figure 5. Small transportable hydrographic boat.



Figure 6. Very shallow water bathymetry system operated from a small rubber boat

Besides the mentioned hydrographic surveys, IHM participated in the Spanish Exclusive Economic Zone (EEZ) exploration, leading the seafloor surveys. This is a long term multidisplinary project developed by IHM in cooperation with other national institutions and universities and conducted on board the Oceanographic Research Vessel “Hespérides”. This platform is usually assigned one month a year for this

mission. In 2017 and 2018, “Hespérides” carried out researches in the Spanish Mediterranean EEZ.



Figure 7. Spanish Navy Oceanographic Research Vessel "Hespérides"

Compiled bathymetric coverage conducted by Spanish navy survey ships from May 2015 to May 2019 is illustrated in the next figure.

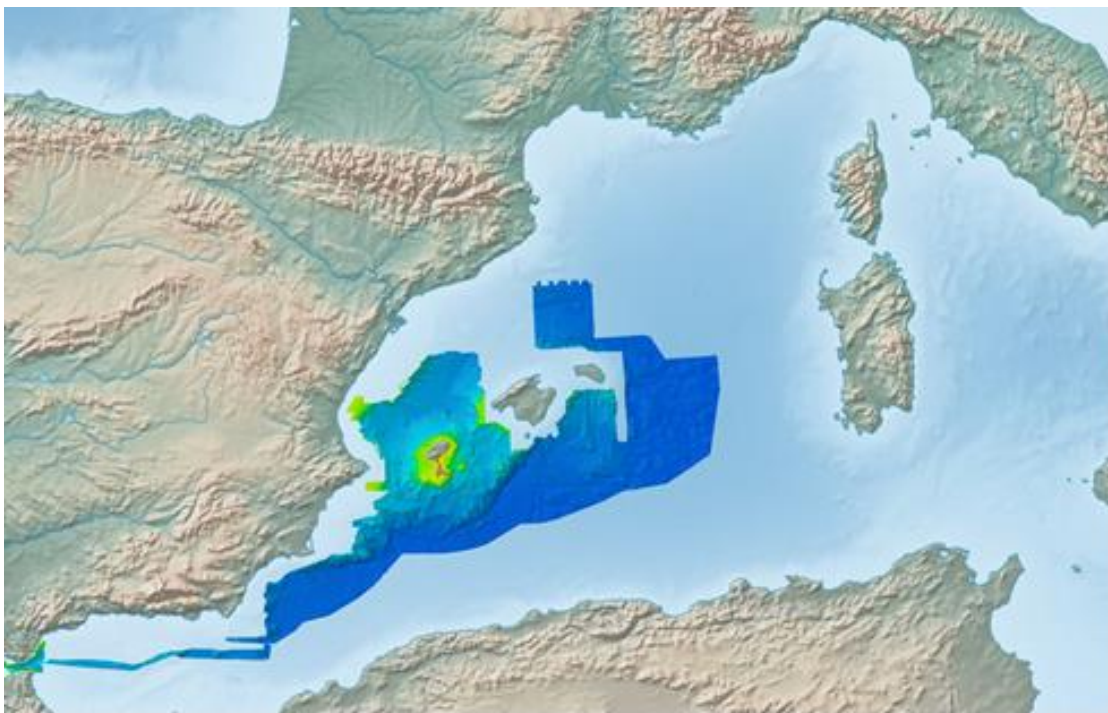


Figure 8. Compiled bathymetric coverage conducted by Spanish navy survey ships from May 2015 to May 2019

Survey planning

Surveys have been prepared by taking into account the type and purpose of each navigational area, in accordance with the IHO S-44 publication. This requirement directs us to assign specific surveys to the right asset (Hydrographic Vessel, Transportable launch or Boat) depending on her hydrographic capability, equipment and endurance.

2.2. New technologies and/or equipment

2.2.1. Cartographic production

The production of charts with CARIS HPD production system is fully established, and work continues on the migration of cartographic production to the new system. A print on demand system (POD) is completely established to print charts embedded in CARIS HPD production system. Nowadays this POD percentage is reaching the 80 % of the total Cartography published by IHM.

2.2.2. Echosounders

New MBES (EM-2040) and PDBS (Geoswath 500 and 250) were acquired and installed on our vessels and boats in order to work in shallow waters.

Our Hydrographic Fleet is currently fitted as follows:

- Two Hydrographic Vessel, “Tofiño” and “Malaspina” (1000 Gross Tons, GT), are equipped with two hull-mounted MBES (for shallow and deep waters). Each vessel has two small hydrographic boats to cover very shallow waters with portable MBES and PDBS.
- One Coastal Hydrographic Vessel “Antares” (400 GT) is fitted with a shallow water MBES and with one small hydrographic boat operating high resolution shallow-water portable MBES and PDBS.
- Three Transportable hydrographic launches have either hull or pole mounted MBES or PDBS in order to conduct Special Order Surveys.

2.2.2.1 Bottom Mapping Sonars

Seafloor mapping is achieved mostly by using MBES and PDBS. Over the last two years, new high resolution portable systems have been purchased and are in use onboard our hydrographic small boat and launches. These new sensors can provide simultaneous co-registered high-resolution side scan sonar imagery and bathymetry within IHO special order accuracy standards. In addition, updated processing methods allow IHM hydrographers to process this data in a swift way so that the ping-to-chart workflow is executed timely.

2.3. New Vessels

Specific projects for new coastal hydrographic vessels have been developed for the last

decade. However, they have not been built yet, due to the budget restrictions. Therefore, IHM has not any date for enjoying new vessels.

2.4. Problems encountered

NTR.

3. NEW CHARTS AND UPDATES

3.1 ENC

To date, IHM has produced 158 ENCs within the area of the MBSHC (out of a total of 300 published for all areas).

Since the last MBSHC meeting, IHM has produced 16 new ENCs, and 42 new ENC editions. This shows the increasing workload associated with maintaining and updating the ENC catalog, which slows the production of new ENCs.

While it continues the work to finish Purpose 5 Project, Purpose 6 Project has started with the most important commercial ports.

Navigational purpose	Projected	Published
1 - Overview	0	0
2 - General	1	1
3 - Coastal	11	11
4 - Approach	45	45
5 - Harbour	105	101
6 - Berthing	30	1
<u>Total</u>	192	158

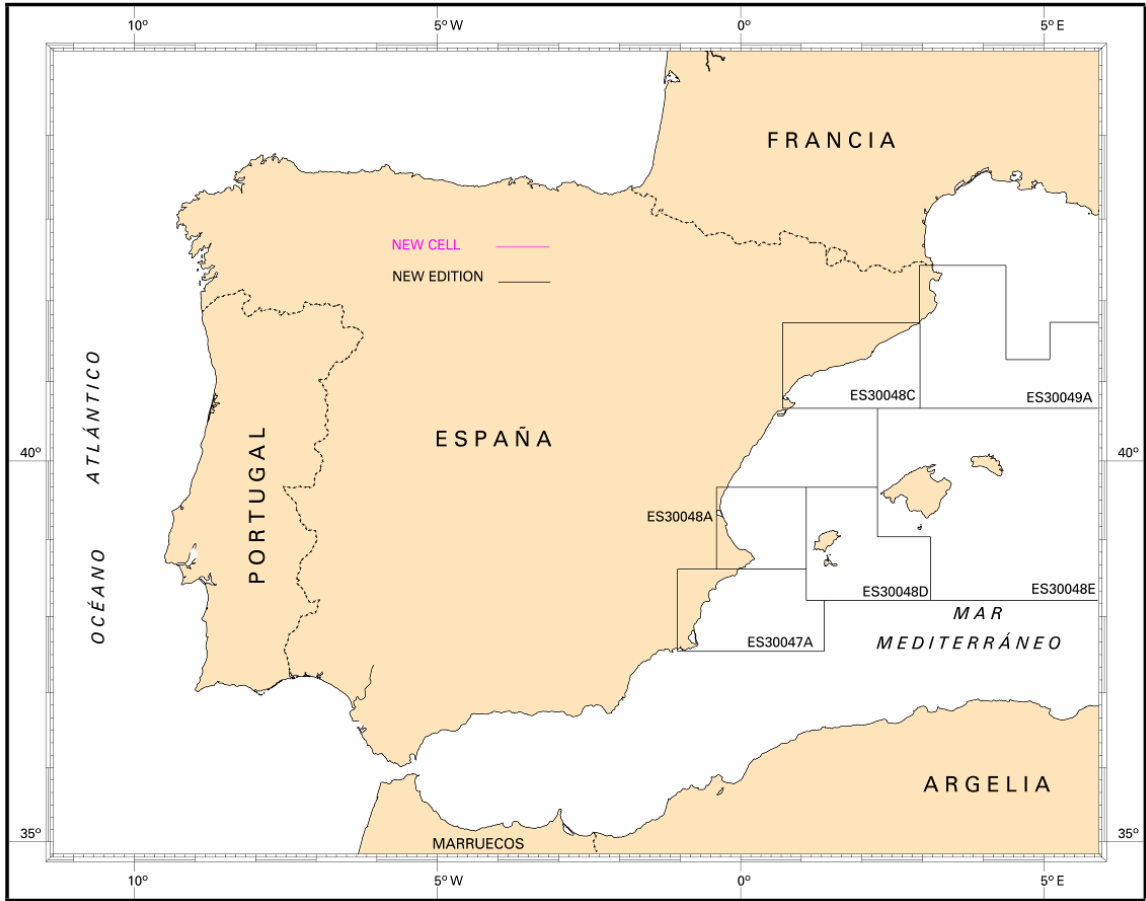


Figure 9. Navigational purpose 2 and 3 ENC production in the MBSHC May 2017-Apr 2019

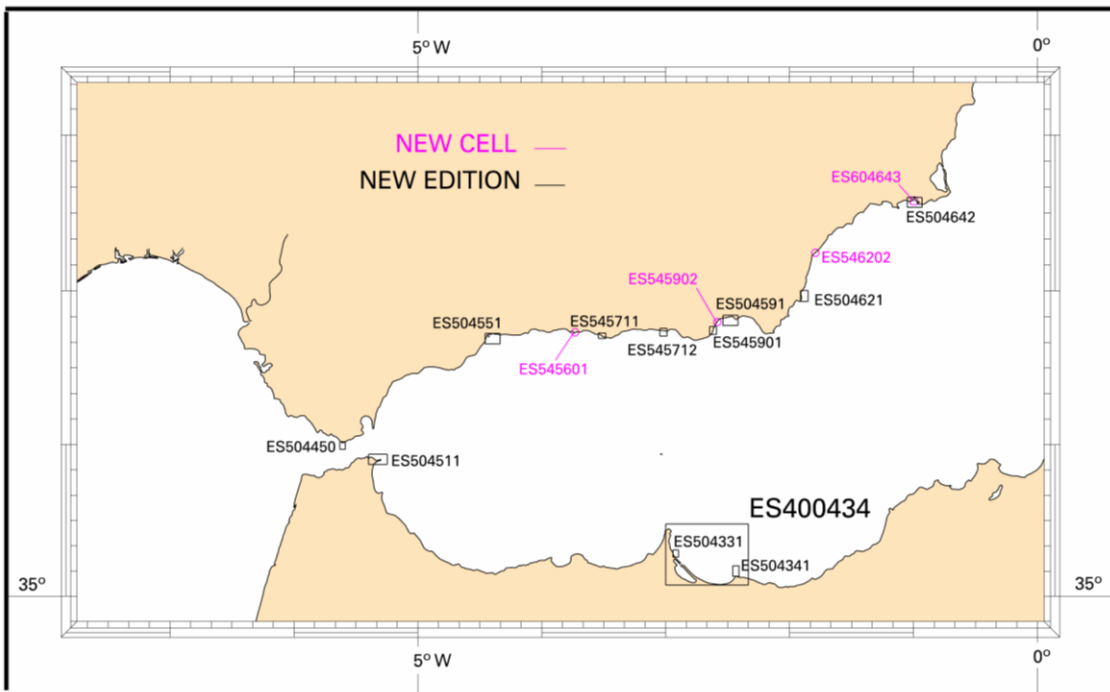


Figure 10. Navigational purpose 4 and 5 ENC production in the MBSHC May 2017-Apr 2019 part 1

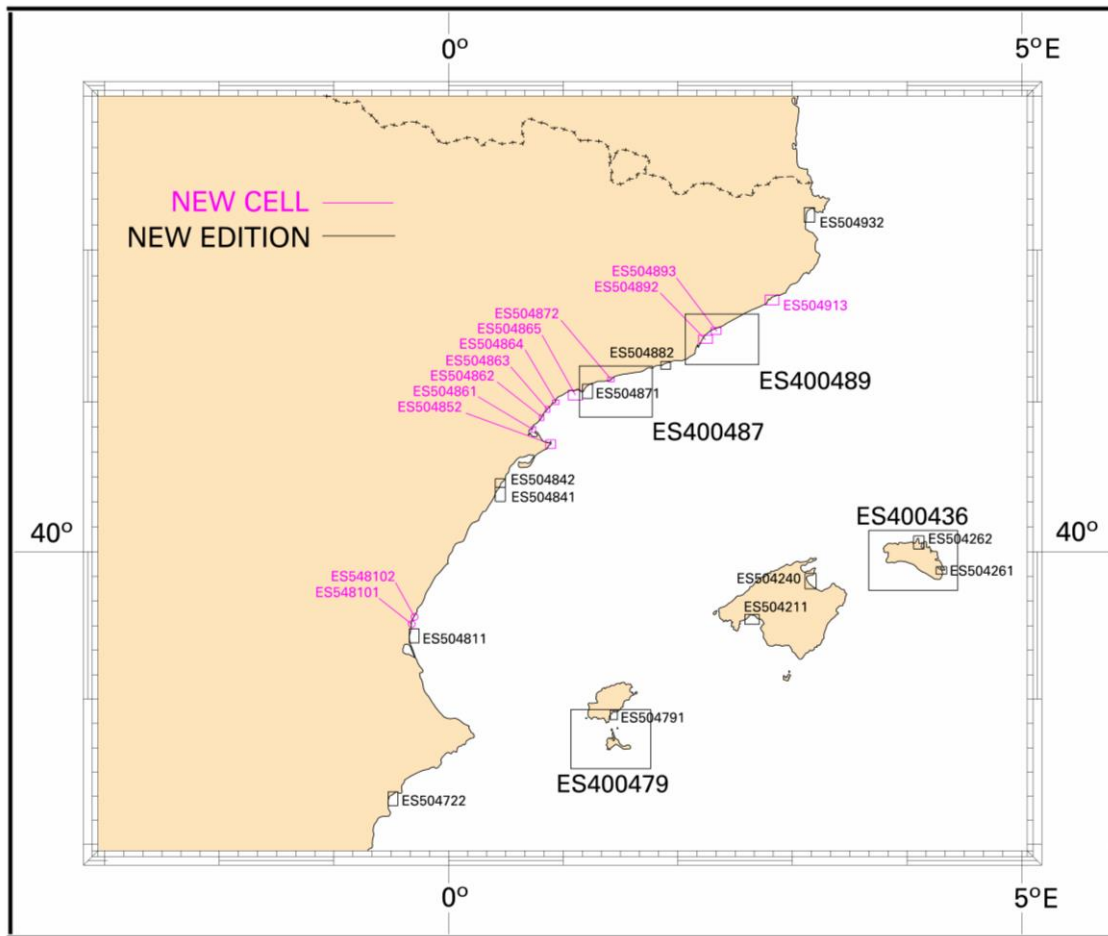


Figure 11. Navigational purpose 4 and 5 ENC production in the MBSHC May 2017-Apr 2019 part2

3.2 ENC distribution method.

Spain is a member of the International Center for ENC (www.ic-enc.org/) RENC from the beginner of the IC-ENC. All Spanish ENCs are distributed by IC-RENC, which carries out validations and consistency checks before distribution. There is close collaboration in development with this RENC, especially regarding the optimization of production and validation processes.

3.3. RNCs.

NQR.

3.4. International Charts.

Nowadays, IHM has produced 58 International charts, 24 within the area of the MBSHC (out of a total of 346 published for all areas).

Since last MBSHC meeting, IHM has produced 2 new INT Charts, and 7 new editions. This table shows the increasing workload associated with maintaining and updating the INT Chart catalog.

Navigational purpose	MBSHC ZONE
INT charts made since the last MBSCH Conference	2
Charts projected for the second semester of 2018, and 2019	7
Status of the INT charts production assigned to IHM pending to be published	8
Leisure Charts published	11
Leisure charts pending to be published	4

Table 1

The next table shows INT charts made since the last MBSCH Conference:

INT No	National No	Title	Edition
4642	3165	Puertos de Cartagena y Escombreras	V Dic 2017
45	3102	Estrecho de Gibraltar y mar de Alborán	VI Nov 2017

Table 2

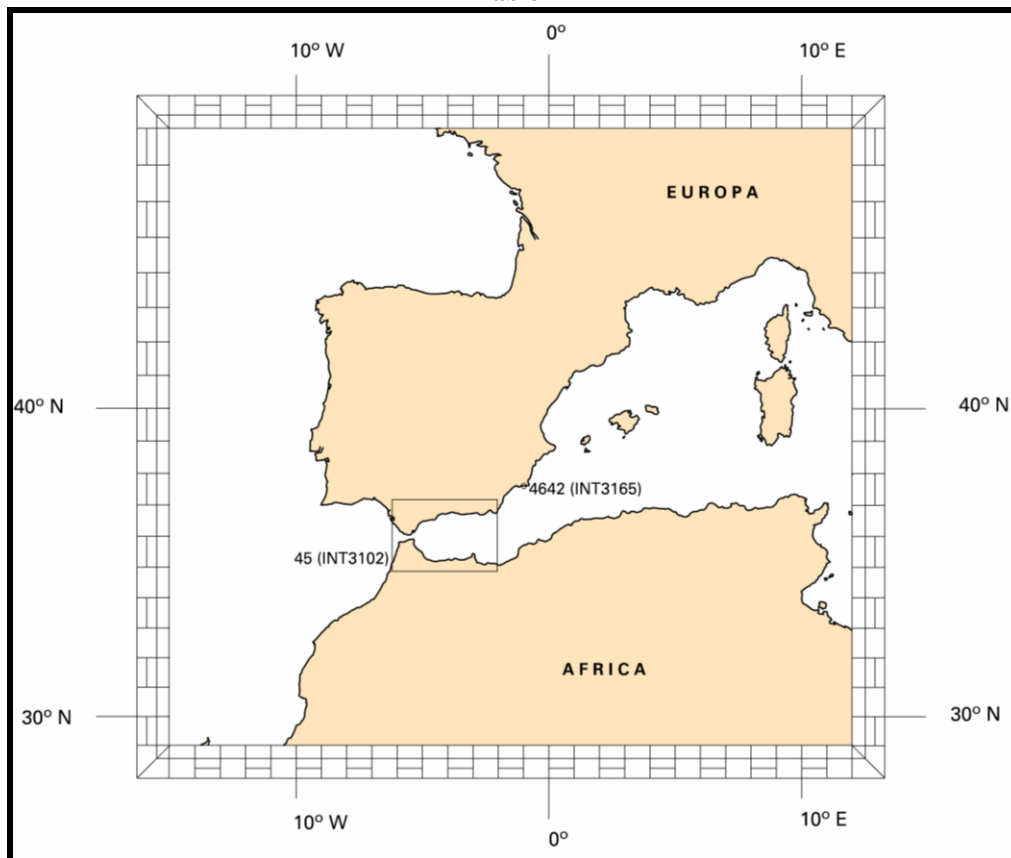


Figure 12. INT charts produced since the last MBSHC Conference

The next table shows INT charts projected for the second semester of 2019, and 2020/21.

INT No	National No	Title	Edition
3101	45A1 (1:275 000)	Estrecho de Gibraltar y Mar de Alborán	TBD ^[1]
3104	46A1 (1:250 000)	Del Cabo de Gata Punta el Caño y de Saídía a Cap Carbón	TBD (2021) ^[2]
3105	47A1 (1:250 000)	De Punta El Cañon a Gandia con Ibiza y Formentera	TBD ¹
3106	46 (1:350 000)	De cabo de Gata a cabo de las Huertas y de cabo Milonia a cabo Ivi	TBD (2020) ^[3]
3107	48A1 (1:250 000)	De la Isla de Tabarca a Peñíscola con Ibiza y Formentera	TBD ¹
3109	48 B1 (1:275 000)	Islas Baleares	TBD ¹
3111	48C1 (1:250 000)	De Las Fuentes a Tossa de Mar	TBD ¹
3113	49A1 (1:275.000)	De Barcelona a Cap Cerbere con las islas de Mallorca y Menorca	I (2019) In Process

Table 3

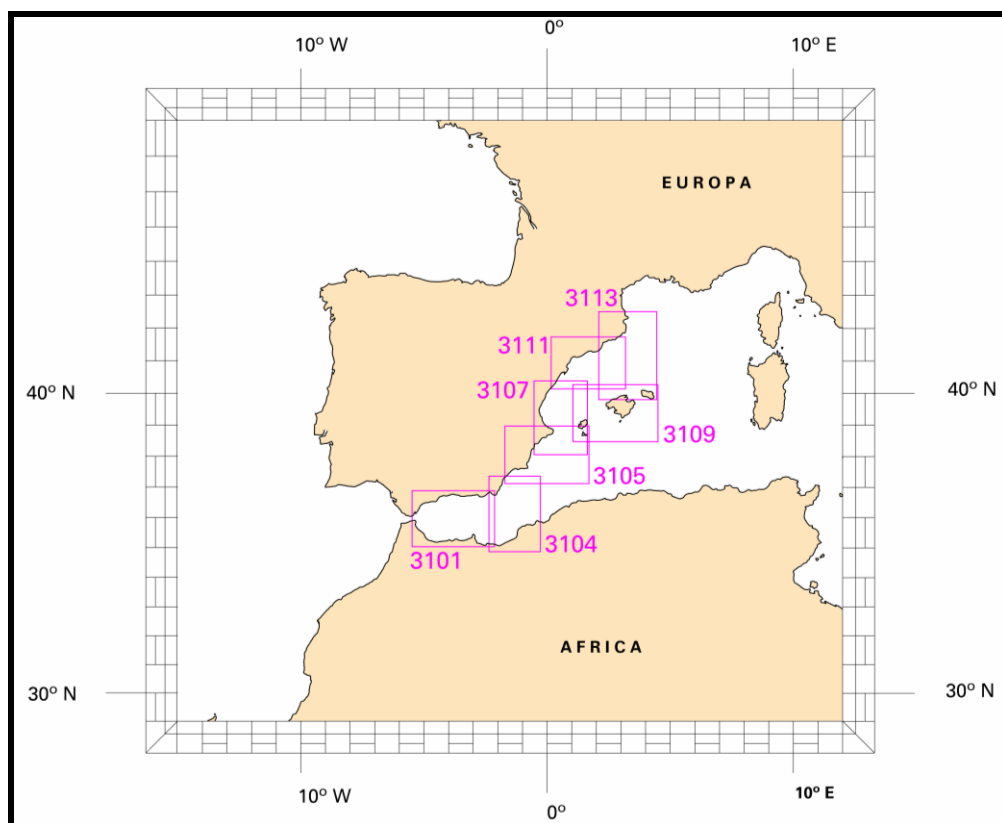


Figure 13. INT paper Charts projected in the MBSHC from May 2017-Apr 2019

The next table shows status of INT charts production assigned to IHM.

^[1] Delayed to 2020/2021 due to HPD conversion.

^[2] Depend on Spanish/Algerian Agreement.

^[3] Depend on Spanish/Algerian Agreement.

INT No.	National No.	Title	Edition	Scale
303	4-C	Mar de Alborán y Mar Balear	97/97	1 000 000
3102	45	Estrecho de Gibraltar y Mar de Alborán	79/08	350 000
3108	47	De Cabo Tiñoso a Cabo Canet con las islas Ibiza, Formentera, Cabrera y Costa sudoeste de Mallorca	76/05	350 000
3110	48	De Cabo de la Noa a Barcelona con las Islas Baleares	78/04	425 000
3112	49	Golfo de León – De Punta del Llobregat a Cabo d’Antibes	79/17	400 000
3150	105	Estrecho de Gibraltar	98/10	100 000
3152	445 A	Côte Sud d’Espagne – Bahía de Algeciras	86/08	25 000
3156	455 A	Aproches del Puerto de Málaga	84/06	25 000
3157	4551	Puerto de Málaga	95/06	10 000
3159	459	Golfo de Almería – De la Punta Sabinar al Cabo de Gata Plan A – Roquetas de Mar	59/07	50 000 7 500
3160	4591	Puerto de Almería	93/07	10 000
3164	464 A	Aproches de Cartagena y Escombreras	85/09	30 000
3165	4642	Puertos de Cartagena y Escombreras	96/07	10 000
3167	472 A	Aproches del Puerto de Alicante	87/09	25 000
3168	4722	Puerto de Alicante	87/09	10 000
3172	481 A	Aproches del Puerto de Valencia Plan A: Pobla de Farnals Plan B: Port-Saplaya	87/10	25 000 10 000 10 000
3173	4811	Puerto de Valencia	94/10	10 000
3175	482 A	Aproches del Puerto de Castellón	95/03	25 000
3176	4821	Puerto de Castellón	91/11	10 000
3179	487 A	Aproches del Puerto de Tarragona	89/04	25 000
3180	4871	Puerto de Tarragona	80/05	10 000
3184	489 A	Aproches del Puerto de Barcelona	87/06	25 000
3185	4891	Puerto de Barcelona	92/11	12 500
3252	4511	Bahía y Puerto de Ceuta	92/09	10 000

Table 4

Status of the production of international charts assigned to Spain.

Scale	Assigned	Produced
Small 5.000.000-1.000.000	1	1
Medium 350.0000-100.000	6	5
Large 80.000-10.000	18	18
TOTAL	25	24 *

* INT 3106, Coproduction as INT Chart between Algeria and Spain. Exist as National Spanish Chart

Table 5

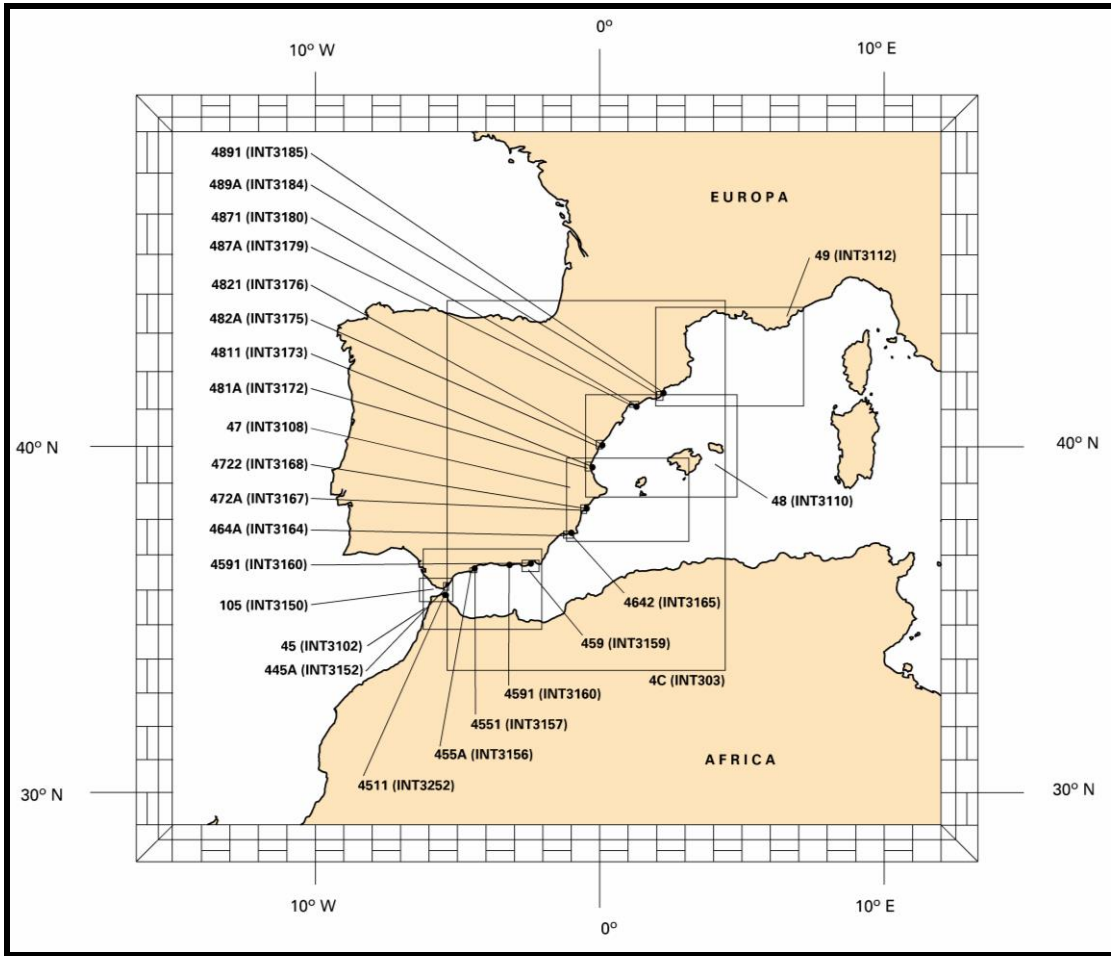


Figure 14. Status of the INT charts production assigned to IHM

The boundaries of medium scale INT charts (3102, 3106, 3108, 3110 y 3112) are being modified to adjust to the boundaries of the corresponding scale of the scheme for INT charts (1:250.000) in accordance with Table 3.

The next table shows the status of the INT charts production assigned to SPAIN Coastal Scale.

INT No.	National No.	Title	Edition	Scale
3106*	46	De cabo de Gata a Cabo de las Huertas y de cabo Milanio a cabo IVI	III oct 2013	1:350 000
3113	49A	De puerto de Barcelona al Cap Cerbere	I Ago 1999	1:175.000

*This chart in coproduction as INT Chart between Algeria and Spain. Exist as National Spanish Chart

Table 6

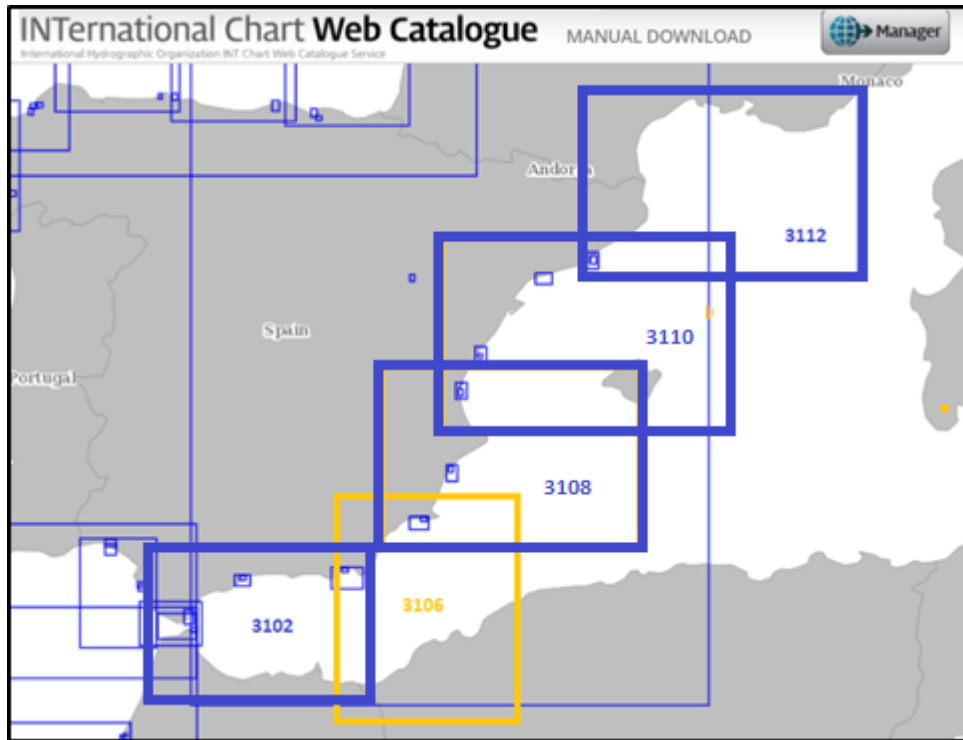


Figure 15. Status of the INT charts production assigned to IHM

3.5 National paper charts.

The next table shows national charts made since the last XX MBSCH Conference:

National No	Title	Edition
4892	Puertos de Sant Adrià de Besòs y Badalona	I Mar 2018
4893	Puertos de El Masnou y Premià de Mar	I Mar 2018
4571	Puertos de Motril y Adra	II Mar 2018
4841	Puertos de Vinarós, Benicarlo y Peñíscola	I Ago 2018
4882	Puertos de Vallcarca, Garraf y Ginesta	I Ago 2018
4341	Islas Chafarinas. Cabo del Agua (Ras El Ma)	III Dic 2018
4913	Puertos de Blanes y cala Canyelles	III Jun 2017
D46	De Marina del Este a San Pedro del Pinatar	I Dic 2017
D47A	De Torre de la Horadada a Dénia	I Dic 2017
D48	De Oliva a Vinarós	I Dic 2017
D48N	De Les Cases de Alcanar a Segur de Calafell	I Abr 2018

Table 7



Figure 16. National Paper Charts produced in the MBSHC May 2017-Apr 2019

3.6 Other charts.

Leisure Charts

Since the new format for leisure charts was implemented, from May 2017 several booklets of leisure charts was published, chart D46, D47A, D48, D48N. There is work in progress regarding three new editions of booklet of leisure charts in the MBS area.

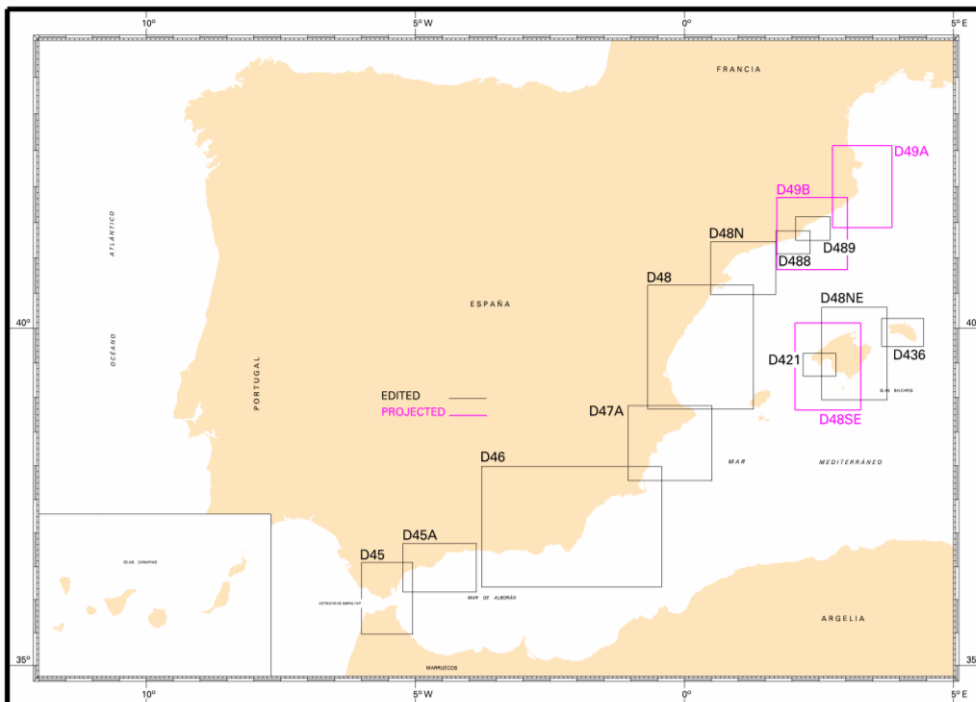


Figure 17. Leisure charts

National No	Title	Edition	Published
D45	De Barbate a Estepona y de cabo Espartel a cabo Negro	I Dic 2014	X
D45A	De Estepona a punta de Torrox	I Dic 2013	X
D488	Del puerto de Vilanova y La Geltrú al puerto de Barcelona	I Dic 2006	X
D489	Del puerto de Barcelona al puerto de Arenys de Mar	I Oct 2008	X
D48NE	De Cala Figuera a Sóller	I Jun 2016	X
D 421	De la isla Dragonera a cabo Blanco	I Jun 2005	X
D436	Isla de Menorca	I May 2004	M
D48	De Oliva a Vinarós	I Dic 2017	X
D46	De Marina del Este a San Pedro del Pinatar	I Dic 2017	X
D47A	De Torre de la Horadada a Dénia	I Dic 2017	X
D48N	De Les Cases de Alcanar a Segur de Calafell	I Abr 2018	X
D48SW	Puertos de Mallorca SW	TBD	TBD
D49B	De Vilanova i La Geltrú a Marina port D'Aro	TBD	TBD
D49A	De Palamós a Portbou	TBD	TBD

Table 8

3.7 Issues encountered.

3.7.1 Gibraltar Colony.

In accordance with (IAW) point 2.4.1., Gibraltar Colony, of the Spanish report region F (MED. & BLACK SEAS), ICC WG, May 2019.

3.7.2 ENC Issues in the Strait of Gibraltar with France and Morocco.

IAW point 2.4.2., ENC Issues in the Strait of Gibraltar with France, of the Spanish report region F (MED. & BLACK SEAS), ICC WG, May 2019.

3.7.3. Paper Chart Issues in the East coast of Spain.

IAW point 2.4.3, Paper Chart in the East coast of Spain scales 1: 250000/1:275000 of the Spanish report region F (MED. & BLACK SEAS), ICC WG, May 2019.

3.7.4. Relations Spain (IHM)/ Morocco (DHOC).

IAW point 2.4.4, Relations IHM (Spain)/DHOC (Morocco), of the Spanish report region F (MED. & BLACK SEAS), ICC WG, may 2019.

4. NEW PUBLICATIONS AND UPDATES.

4.1 New publications.

NTR

4.2 Updated publications.

Publications are updated via Notice to Mariners ([Avisos a los Navegantes](#)) booklet which can also be downloaded free of charge from the IHM section in the Spanish Navy Official Website.

4.2.1 Charts new editions:

- A new edition of «*Catálogo de Cartas Náuticas y otras publicaciones*» (Catalogue of Nautical Charts and Publications) was published in the first quarter 2018 y 2019.

4.2.2 Nautical publications

- IHO S-4 associated publication *INT 1 – Symbols, Abbreviations and Terms use on Charts (Spanish version)*, 6th edition 2018.
- *Regulations for International (INT) Charts and Chart Specifications of the IHO* (Spanish: Edition 4.8.0, October 2018).
- *List of lights and fog signals, part I 2019 edition*. Atlantic Spain and Portugal coast and occidental Africa coast from Espartel Cape to Verde Cape (Senegal) and Azores, Madeira, Canary and Cape Verde islands.
- *List of lights and fog signals, part II 2017 edition*. Gibraltar Strait, Balearic Islands and Mediterranean coasts of Spain, Morocco and Algeria.
- *Sailing Directions num. 1*. From Río Bidasoa to Río Rivadeo.
- *Sailing Directions num. 2*. From Río Rivadeo to Cabo Finisterre.
- *Sailing Directions num. 3*. From Cabo Finisterre to Río Miño.
- *Sailing Directions num. 4*. From Río Miño to Río Guadiana, and Azores Islands.
- *Sailing Directions num. 5*. From Río Guadiana to Cabo Sacratif and the North and South coasts of Gibraltar Strait.
- *Sailing Directions num. 6*. From Cabo Sacratif to Cabo La Nao, North Coast of Morocco and Coast of Algeria to Cabo Kramis.
- *Sailing Directions num. 7*. From Cabo La Nao to France Border.
- *Sailing Directions num. 8*. Balearic Islands and North Coast of Algeria from Cabo Kramis to Tunisia Border.
- *Sailing Directions num. 9*. Northeast coast of Africa from Cabo Espartel to Cabo Verde. Madeira, Selvagens, and Cape Verde islands.
- *Sailing Directions num. 10*. Canary Islands
- *Radiosignals book 2019 edition*.
- *Official Annual Tide tables from Spanish Hydrographic Office*

4.3. Means of delivery

Charts and other nautical publications produced by the IHM can be purchased through the net of authorized sales agents. Contact information with these sales agents is available in the following internet address:

[IHM sales agents](#)

http://www.armada.mde.es/ihm/Aplicaciones/Agentes/Index_Agencias_xml.htm

A digital version of the publication *List of Lights and Fog Signals* is currently available online, which is an interactive application, in the following internet address:

Faros y Señales de Niebla

<http://www.armada.mde.es/ihm/Aplicaciones/LibroFaros/V3/index.html#>

The figure consists of three screenshots of the 'Faros y Señales de Niebla' interactive tool. The top screenshot shows a search interface for 'RÍA DE FERROL' with a map and a detailed view of the 'Señal marítima 03250'. The middle screenshot shows a page for 'Faro de D'EN POU' with a photograph of the lighthouse and an informational note. The bottom screenshot shows a search interface for 'Índice Península, Baleares y Canarias' with a map of the region.

Screenshot 1: Search Interface for RÍA DE FERROL

Top navigation: Buscador, Novedades, Ayuda, Contacto, English, Salir

Search criteria: Carta >> 4122: Acceso a la ría de Ferrol

Form fields: Nombre o Localización: ; Señal marítima: ; Carta: ; Fuente cartográfica: ; WGS-84; Lat: 43 ° 29.496 ' N; Lon: 8 ° 17.592 ' W

Map: Shows the Ría de Ferrol area with a red marker.

Panel: Señal marítima 03250

RIÁ DE FERROL
San Cristobal. Luz direccional
180°

Característica diurna

43 29,073 N 08 18,395 W
Torne cuadrangular blanca
Elevación: 30m Altura: 8

Imagen proporcionada por la Autoridad Portuaria, CC.AA.

Característica luminosa

DuFWRG 10M
032,2° V 041,5° B 042,3° R 045,7°
AIS sintético

La representación luminosa es un ejemplo, podría no ajustarse exactamente al ritmo que está mostrando la señal

Bottom navigation: Selección de Señales marítimas para impresión (TODAS, Imprimir, Limpiar); Selección alcance o Señales marítimas con incidencia (Alcance >= 20 M, Alcance >= 15 M, Alcance >= 5 M, S.M. con incidencias)

Screenshot 2: Faro de D'EN POU

Top navigation: Buscador, Novedades, Ayuda, Contacto, English, Salir

Última actualización: 13/05/2019

Faro de D'EN POU

Image: Aerial view of the Faro de D'EN POU lighthouse on a small island.

Faros y Señales de Niebla

Nota informativa

Esta aplicación facilita, a todos los usuarios interesados, el acceso a los datos sobre señalización marítima existentes en las publicaciones *Faros y Señales de Niebla, Partes I y II*. De ningún modo, esta aplicación sustituye a las publicaciones anteriormente citadas, y por lo tanto los navegantes no están exentos de continuar llevándolas a bordo, así como el resto de las publicaciones náuticas, debidamente actualizadas.

Acerca del navegador

La aplicación Faros y Señales de Niebla está optimizada para funcionar con los navegadores **Firefox, Chrome** o **Explorer 11**.

Footer: Instituto Hidrográfico de la Marina, Martes 14 de Mayo de 2019.

Screenshot 3: Search Interface for Índice Península, Baleares y Canarias

Top navigation: Buscador, Novedades, Ayuda, Contacto, English, Salir

Search criteria: Carta >> Índice Península, Baleares y Canarias

Form fields: Nombre o Localización: ; Señal marítima: ; Carta: ; Fuente cartográfica: ; Google; WGS-84; Lat: 42 ° 21.444 ' N; Lon: 4 ° 24.078 ' E

Map: Shows the Iberian Peninsula, Balearic Islands, and Canary Islands with a red marker.

Panel: Zona o Carta

- Costa Norte Oriental
- Costa Norte Occidental
- Costa Noroeste
- Costa Suroeste
- Costa Sur
- Costa Sudeste
- Costa Este
- Costa Nordeste
- Costa Nordeste
- Islas Baleares
- Islas Canarias

Figure 18. Screenshots of the List of Lights and Fog Signals interactive tool

Since 2018, a new online interactive application for the *Spanish Tidal Predictions* is available in the following internet address:

[Spanish Tidal Predictions](http://www.armada.mde.es/ArmadaPortal/page/Portal/ArmadaEspañola/cienciaih)

<http://www.armada.mde.es/ArmadaPortal/page/Portal/ArmadaEspañola/cienciaih>
[m1/prefLang-es/02ProductosServicios--045PrevisiondeMareas](http://www.armada.mde.es/ArmadaPortal/page/Portal/ArmadaEspañola/cienciaih)

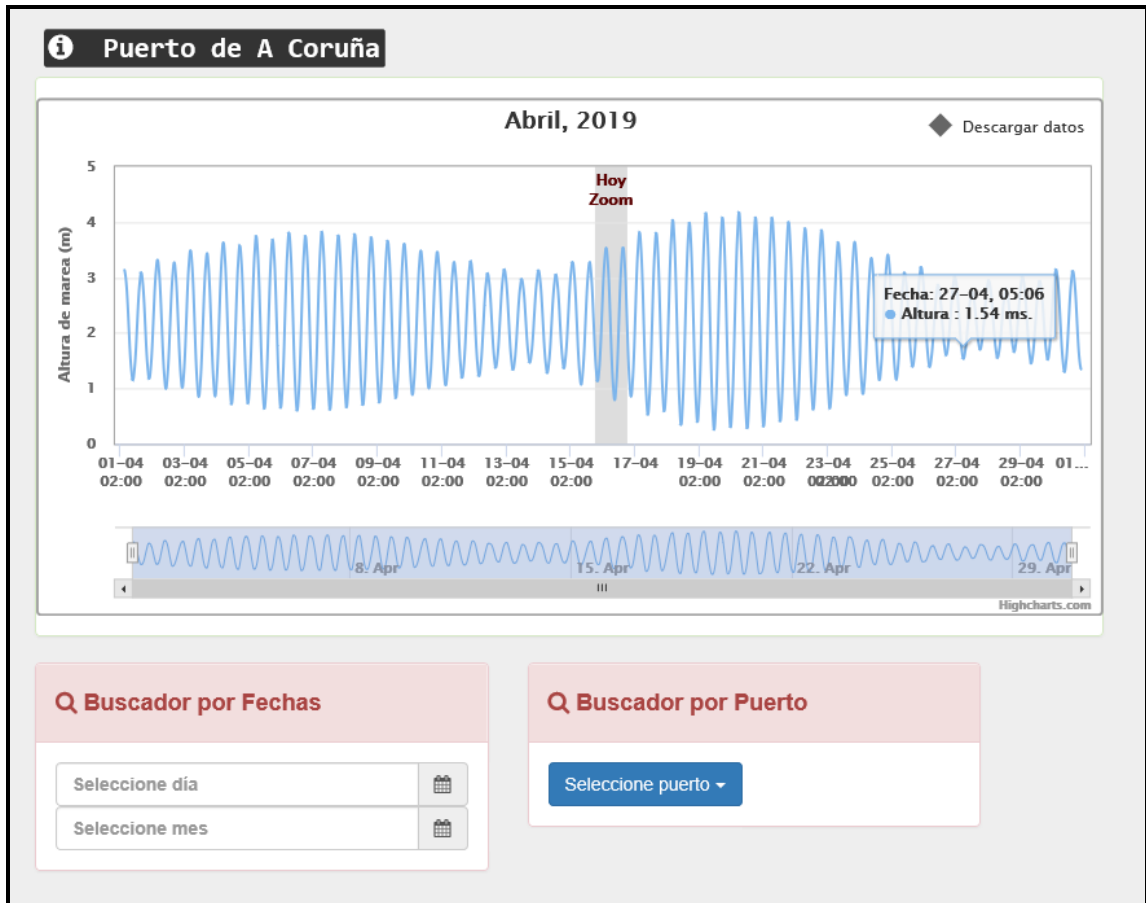


Figure 19. Screenshot of the Spanish Tidal Predictions online application

4.4. Problems encountered.

NTR.

5. MSI

Spain (IHM) 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. Coastal Navigational Warnings in Spanish Coasts

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 Co- ordination Centre (CNCS) is located in Madrid.

Control Remote Stations (CCRs): Valencia, Las Palmas.

Valencia CCR: NAVTEX Station: La Nao [X] [M] (490 Khz, Spanish)
MF Coast Radio Stations (CRSs): La Nao, Palma de Mallorca, Cabo de Gata.
VHF Coast Radio Stations (CRSs): Cabo de Gata, Melilla, Cartagena, La Nao, Castellón, Tarragona, Barcelona, Begur, Cadaqués, Menorca, Palma de Mallorca , Ibiza.

Las Palmas CCR: NAVTEX Station: Tarifa [G] [T] (490 Khz, Spanish)
MF Coast Radio Stations (CRSs): Tarifa.
VHF Coast Radio Stations (CRSs): Tarifa, Malaga, Motril,

SASEMAR liaises with IHM for broadcasting coastal warnings through NAVTEX Stations.

NAVAREA III Coordinator. NAVAREA III warnings are broadcast via SAFETYNET through Burum Land Earth Station and AOR-E Satellite over the whole region.

IHM liaises with SHOM and SASEMAR exchanging NAVAREA warnings originated in each region that are relevant for each coordinator.

IHM publishes the Notice to Mariners bulletin **weekly** which include the NAVAREA warnings in force.

5.1.2. SAR Organisation

Coordinator: SASEMAR through its National Rescue Coordination Centre (CNCS) located in Madrid and 10 Maritime Rescue Coordination Centres (CCSs): palamós, Barcelona, Tarragona, Castellón, Valencia, Palma de Mallorca, Cartagena, Almería, Algeciras, Tarifa.

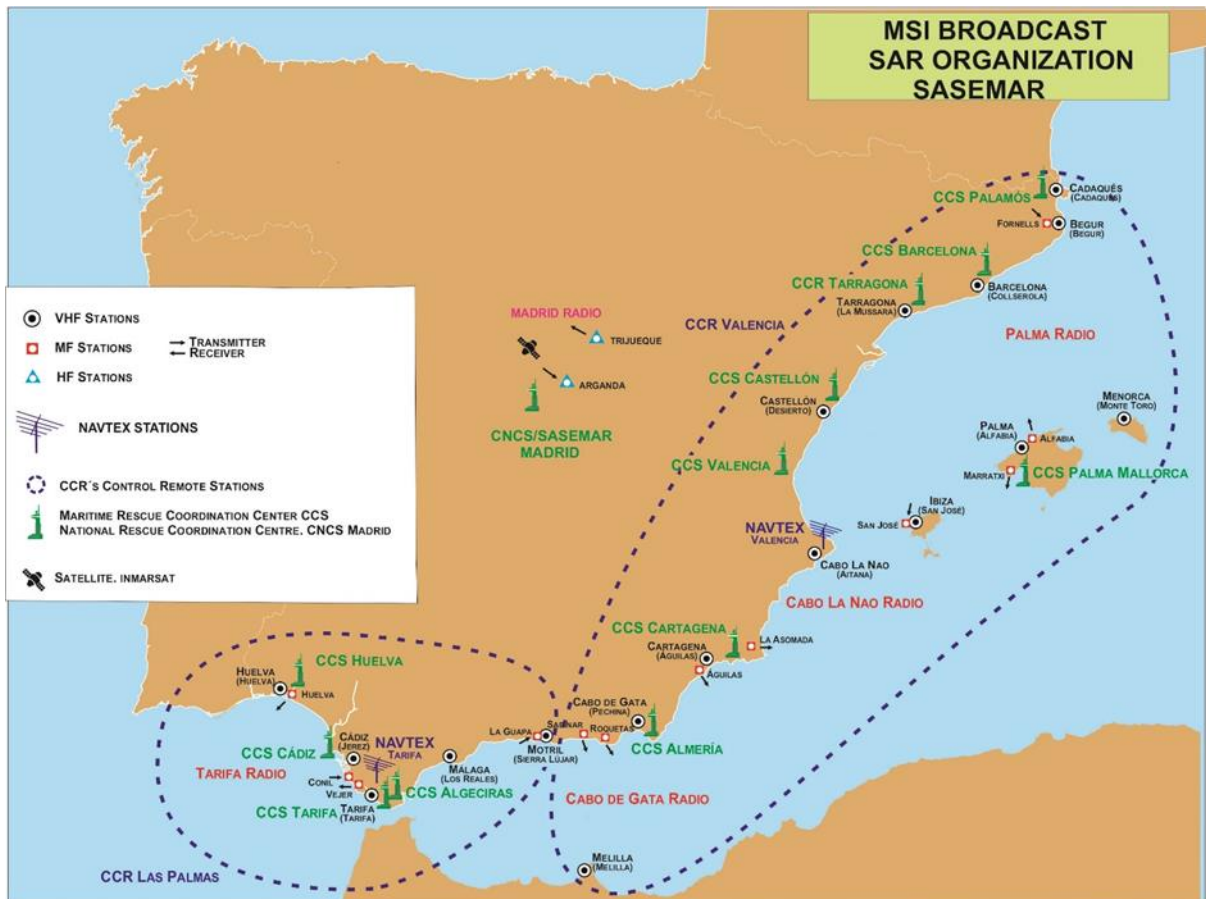


Figure 20. MSI Broadcast and SAR organization

5.2. New infrastructure in accordance with GMDSS Master Plan

NTR.

5.3. Problems encountered.

NTR.

6. S-55.

6.1. Spain. Cartographic Region F.

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	40	60	0
Dephts > 200 m	90	0	10

Table 9

This table has been updated not considering now single beam coastal surveys (<200 m) as complying adequately with S-44 standards. Only multi beam surveys have been considered.

6.1.2 Cartographic production

Status of cartographic production within the Spanish EEZ.

A= percentage covered by INT chart series, or paper charts complying with S-4 regulations.

B = percentage covered by raster charts (RNCs) complying with S-61 regulations.

C = percentage covered in accordance with S-57 regulations.

Purpose / Scale	A	B¹	C
Offshore passage / Small	100	0	100
Landfall and Coastal passage/ Medium	100	0	100
Approaches and Ports / Large	100	0	84

Table 10

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			
PORT INFORMATION	X			Agreements with all Port Authorities

Table 11

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.

Table 12

¹ Spain does not produce raster charts.

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 hydrographic surveyor Category A and B courses. These courses are 10-month long and are taught in Spanish. Minimum academic enrolling requirements should be fulfilled.

On 31st December 2018 the Specialization Program in Hydrography & Oceanography for Naval Officers (Category A) was presented, and defended the 1st April 2019 to the FIG/IHO/ICA International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers, **getting its recognition.**

The virtual portal, as a supporting knowledge center for students including a repository for teaching documents, regulations, procedures, relevant links and various learning resources is implemented. Also, the learning platform MOODLE is used both in online training and to complement classroom courses, as it can be used as a basic repository of student resources and as a network learning environment for students to interact, access content and complete tasks, monitoring their full performance online and in the classroom.

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

Category A course:

Academic year 2018-2019.

- 2 Officers from the Spanish Navy
- 1 Officer from Argentina
- 1 Officer from Tunisia
- 1 Officer from Cabo Verde

Academic year 2017-2018.

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

Academic year 2016-2017.

- 2 Officers from the Spanish Navy
- 1 Officer from Mauritania
- 1 Officer from Morocco
- 1 Officer from Argentina
- 1 Officer from Uruguay

Academic year 2015-2016.

- 2 Officers from the Spanish Navy
- 1 Officer from Algeria
- 1 Officer from Morocco

From 2009-2015

- 14 Officers from the Spanish Navy
- 2 Officer from Algeria
- 1 Officer from Argentina
- 1 Officer from Dominican Republic
- 1 Officer from Guatemala
- 1 Officer from Honduras
- 1 Officer from Morocco
- 1 Officer from Tunisia

Category B course:

Academic year 2018-2019.

- 3 Petty Officers from the Spanish Navy

Academic year 2017-2018.

- 4 Petty Officers from the Spanish Navy

Academic year 2016-2017.

- 3 Petty Officers from the Spanish Navy

Academic year 2015-2016.

- 3 Petty Officers from the Spanish Navy
- 1 Petty Officer from the Morocco

From 2009-2015.

- 11 Petty Officers from the Spanish Navy
- 3 Petty Officer from Dominican Republic

Nowadays, all the students who take the aforementioned courses are military personnel. The attendance of non-Spanish students is offered though a Collaboration Agreement with regard to military training, signed between the Spanish Ministry of Defense and other countries *Collaboration Program with Foreign Countries regarding Military Training*. This agreement provides grants for the attendance to the abovementioned courses.

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

7.2 Training requests, requirements, offers.

Currently there are several Spanish officers who have attended different master studies:

- Master in Geographical Information Quality Evaluation and Management. (University of Jaen) from September 25, 2017 to November 23, 2018. Currently performing practices at the IHM.
- Geospatial Information Course. From November 5, 2018 to July 26, 2020. Madrid.
- Master in Advanced Hydrography for Professionals Course, from May 2018 to July 2020. Plymouth.

Two members of the ENC Office staff attended the Fourth Course on ENC Validation 2019 (“IC-ENC Validation Training Course”) at the IC-ENC facilities in Genoa from 2th to 11th April 2019.

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

Two bilateral agreement with Algeria, pending the official signature:

- Bilateral cooperation agreement between Hydrographic Services IHM and “Service Hydrographique des Forces Navales” (SHFN) from Algeria.
- Technical co-production agreement for INT charts 3104 and INT 3106: co-production INT chart 3106 (1:350.000) immediately after the signature of agreement as an interim INT chart, and then, co-production INT 3104 (1:250.000) several months after the agreement (delete INT 3106).

One bilateral agreement update with United Kingdom, pending the official signature:

- Bilateral agreement between United Kingdom Hydrographic Office and IHM.

7.4 Definition of bids to IHOCBC

Specialization Course in Hydrography & Oceanography for Naval Officers (Category A) and Chief Petty Officers and Petty Officers (Category B): Every year, each course can be requested by 4 foreign students.

The attendance of non-Spanish students is offered through a Collaboration Agreement with regard to military training, signed between the Spanish Ministry of Defense and other countries Collaboration Program with Foreign Countries regarding Military Training. This agreement provides grants for the attendance to the abovementioned courses.

In MBSHC area: Albania, Algeria, Bulgaria, Croatia, Egypt, Georgia, Israel, Lebanon, Libya, Morocco, Serbia, Tunisia, Ukraine.

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

8. OCEANOGRAPHIC ACTIVITIES

8.1 General

During the last 7 years, one of main efforts of the Oceanographic Section in relation with tides has been aimed on making tide real time tide data available to IHM Hydrographic Commissions, This improves workflow and reduces times and data confidence while doing bathymetric works.

For this purpose, a WEB interface is required for remote access to the tide data. This interface provides access not only to IHM stations, but also to stations that belong to other organizations that have signed agreements to share tide data. This website is working and is subject to continuous improvements.

8.2 GEBCO/IBC's activities

The IHM, as a partner, has been part of the EMODNET Project from 2013 to June 2016.

GEBCO is making use of data from the EMODNET Project

8.3 Tide gauge network

Stations available have been deployed by hydrographic commissions together with fixed stations of IHM and collaborating organizations, so that the bathymetric work can include near real time tide data.

8.4 New equipment

In 2018, a SBL Klein 4900 equipment with depressor has been purchased, which allows working at equipment specifications depth.

8.5 Problems encountered

NTR.

9. OTHER ACTIVITIES

9.1 Participation in IHO Working Groups

IHM take part in the Assembly 2017 and Council 2017 and 2018.

IHM takes part in several Hydrographic Commission of the IHO:

- Hydrographic Commission on Antarctica (HCA)
- East Atlantic Hydrographic Commission (EAtHC)
- Mediterranean and Black Sea Hydrographic Commission (MBSHC)
- Meso American - Caribbean Sea Hydrographic Commission (MACHC)

And in some working groups of the IHO:

- Hydrographic Services and Standards Committee (HSSC)
- Nautical Information Provision Working Group (NIPWG)
- Nautical Cartography Working Group (NCWG)
- Tidal and Water Level Working Group (TWLWG)
- Marine Spatial Data Infrastructure Working Group (MSDIWG)
- World-Wide Navigational Warning Service Sub-Committee (WWNWS)
- Finance Committee (FC).
- ENC Standards Maintenance Working Group (ENC-WG).
- S-100 Working Group (S-100 WG)
- Inter-Regional Coordination Committee (IRCC)
- Strategic Plan Review Working Group (SPRWG).
- Definition and Length of Coastline Working Group.
- IHO-EU Network Working Group (IENWG)

IHM takes part in several working groups of the NATO:

- Geospatial Maritime Working Group (GMWG).
- Defense Maritime Geospatial Exchange Model (DMGEM).
- AML Co-Production Program (NACPP) (Additional Military Layers).
- Military Oceanography Working Group (MILOC).

9.2 Meteorological data collection

The IHM collaborates with the State Meteorological Agency (AEMET) in the collection of information in the maritime field, its analysis, and in the preparation of products for use in the Spanish Armed Forces and NATO countries.

9.3 Geospatial studies

IHM participate in the several national projects and EU project GALILEO as the main researcher of the signals reception tests of the GALILEO GNSS constellation in high latitudes (Antarctica) compared to the others GNSS system during 4 years. The following tests (fifth) will be done in 2020.

9.4 Disaster prevention

IHM participate in the Preparedness and Awareness, Information Workshop on NEAMTWS (North-eastern Atlantic, the Mediterranean and connected seas

Tsunami Warning System) reducing Tsunami Risk through Early Warning System was held in “Escuela Nacional de Protección Civil” (National School of Civil Protection) Madrid, Spain, 25-26 September 2017.

IHM participated in NEAMWave17 exercise (31 Oct –3 November 2017) as NAVAREA III Coordinator.

9.5 Environmental protection

NTR

9.6 Astronomical observations

NTR

9.7 Magnetic/Gravity surveys

NTR

9.8 MSDI Progress

Within SDI's, this IHM is a participant in the GT-IDEE (Working Group on Infrastructure of Spatial Data of Spain), tasked with the integration via internet of geographic data, metadata, services and information produced in Spain, to help users locate, identify, select and access such resources via the IDEE geoportal (<http://www.idee.es>).

Also, the Spanish Central Archive of Cartography (Instituto Geográfico Nacional) has been provided with digital information produced by the IHM, including the Spanish coastline at scale 1:50000, straight territorial sea baseline and de Spanish Exclusive Economic Zone in the North-western Mediterranean. This information is available to free download in the following internet address:

[Centro de Descargas del CNIG \(IGN\)](#).

The IHM has developed its own SDI (IDE-IHM), with the purpose to give an answer to the increasing demand of users to have access to nautical information.

<http://ideihm.covam.es/index1.html> and in English language

http://ideihm.covam.es/Index1_en.html

Currently, this IDE-IHM is offering the following services:

GOBIERNO DE ESPAÑA MINISTERIO DE DEFENSA **ARMADA ESPAÑOLA** INSTITUTO HIDROGRÁFICO DE LA MARINA

Geoport de la Infraestructura de datos espaciales del Instituto Hidrográfico de la Marina

Presentación INSPIRE-IDE Servicios web Visor Licencias Legislación Metadatos Contactanos

Presentación



Con la apertura de este GeoPortal, el [Instituto Hidrográfico de la Marina \(IHM\)](#), se suma a la ya nutrida lista de Organismos que ofrecen sus datos geográficos al público bajo la Infraestructura de Datos Espaciales de España (IDEE) basada en la [Ley 14/2010 sobre las Infraestructuras y servicios de información geográfica en España \(LISIGE\)](#) que nace, a su vez, como transposición de la [Directiva Europea 2007/2/CE \(INSPIRE\)](#).

Esta apertura nace por la necesidad de cumplir con la mencionada legislación y para atender, de acuerdo a ella, la creciente necesidad que la sociedad tiene de emplear la información geográfica náutica para otros fines distintos al de la propia navegación.

Es necesario recalcar que la misión principal del IHM es contribuir a la seguridad en la navegación mediante la edición y producción de la cartografía náutica oficial del Estado, tanto en su versión de papel como digital. Sin embargo, las peculiaridades de este tipo de cartografía, principalmente debidas a su continua actualización (semanal) y el compromiso con la seguridad que conlleva, tiene como resultado un producto digital ([Electronic Navigational Chart, ENC](#)) muy específico que se encuentra normalizado internacionalmente para su uso exclusivo en las consolas [ECDIS \(Electronic Chart and Display Information System\)](#) a bordo de los buques y protegido mediante un sistema de seguridad rígido que evita su difusión ilegal. Así, la demanda de la información náutica digital, por parte de la sociedad, no ha podido ser atendida mediante este producto debido, principalmente a dos factores: el primero es que, el IHM, no debe salir de este esquema de seguridad establecido mediante acuerdos internacionales; y segundo, los demandantes no disponen de las consolas apropiadas capaces de «leer» este tipo de producto.



La ENC

Por las razones expuestas, hasta la apertura de este GeoPortal, el IHM, se ha visto en la obligación de atender las demandas de información náutica, que se han producido a lo largo de los últimos años, mediante la creación de productos específicos muy concretos y adaptados a la demanda recibida. Evidentemente, este tipo de servicios han supuesto una carga de trabajo y asignación de personal específico para ello, que ha supuesto un considerable esfuerzo más allá del propio que el IHM ha de

GOBIERNO DE ESPAÑA MINISTERIO DE DEFENSA **ARMADA ESPAÑOLA** INSTITUTO HIDROGRÁFICO DE LA MARINA

Geoport de Spatial Data Infrastructure Instituto Hidrográfico de la Marina

Presentation INSPIRE-SDI Web Services Viewer Licences Legislation Metadata Contact us

GOBIERNO DE ESPAÑA MINISTERIO DE DEFENSA **ARMADA ESPAÑOLA** INSTITUTO HIDROGRÁFICO DE LA MARINA

Geoport de la Infraestructura de datos espaciales del Instituto Hidrográfico de la Marina

Mapas

- Mapa Base
- Capa base
- Marine-Geo
- Cartas Náuticas
 - ENC completo
 - ENC-propósito 2
 - ENC-propósito 3
 - ENC-propósito 4
 - ENC-propósito 5
- Costa
 - Línea de Costa
- Límites Administrativos
 - Líneas de Base Recta
 - M.Terr. y Z.Cont. (ES-FR)
 - Plataf. Continental
 - ZEEE
 - Puntos ZEEE
- Catálogo de ENCs
 - Marcos propósito 2
 - Marcos propósito 3
 - Marcos propósito 4
 - Marcos propósito 5
- Catálogo de Cartas

Kilómetros 0 200 400 Escala = 1: 10M Ver coordenadas: EPSG:4326 (Geog.) 40°05'51.6"N, 04°26'00.3"O

© Instituto Hidrográfico de la Marina, 2019

Figure 21. Screenshot of the Spanish Maritime SDI (IDE-IHM)

- **Nautical Chart WMS Services.**

These services provide access to some geographical information, which is included in the Spanish IHM official nautical cartography. The data is selected from different proposal of navigation Electronical Nautical Chart (ENC) already produced by the Spanish IHM. The visual representation mimics the standard S52 of IHO, including information for the type standard, adding depths and obstructions.

- **WMS/WFS for Spanish Coast line.**

These services provide capabilities to display and download the Spanish coastline included in the official nautical cartography (scale 1:50.000).

- **CSW Service of Metadata Catalog (Spanish IHM Nautical Chart).**

This service provide capabilities of Catalog and searching of metadata files published in the IDE-IHM as WMS Service, WMS Layers, Electronic Nautical Chart (ENC) and Paper Nautical Chart (PNC).

- **WMS/WFS for straight territorial sea baseline.**

These services provide capabilities to display and download, the straight territorial sea baseline (LBR in Spanish language).

- **WMS/WFS for Maritime boundaries.**

These services provide capability to display and download the maritime limits as national territorial waters, contiguous zone, continental platform and exclusive economic zone.

- **WMS/WFS for IHM nautical chart catalogue scheme.**

These services provide capabilities to display and download the Spanish IHM nautical chart catalogue scheme, both for paper nautical chart and Electronic Nautical Chart (ENC).

- **WMS/WFS for military maritime practice areas.**

These services provide capabilities to display and download, the scheme with the assigned areas for military training (amphibious, aerial, surface and submarine).