



# **PORTUGAL NATIONAL REPORT**

## **13<sup>TH</sup> SOUTHERN AFRICA AND ISLANDS HYDROGRAPHIC COMMISSION (SAIHC) MEETING**

Cape Town, South Africa

29<sup>th</sup> – 31<sup>st</sup> August 2016

INSTITUTO HIDROGRÁFICO  
(IHPT)

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## **INTRODUCTION**

This report describes the main technical activities and developments at Instituto Hidrográfico (IHPT), the Portuguese Hydrographic Office, during the period from September 2015 to August 2016. It was elaborated in order to be presented to the 13<sup>th</sup> SAIHC Meeting and covers the following areas: Hydrography, Cartography, Information Technologies and GIS, Marine Safety, and Technical Assistance and Training.

### **1- HYDROGRAPHIC OFFICE**

The IHPT is a part of the Portuguese Navy and has the fundamental task of ensuring activities related to science and techniques of the sea, with a view to their military application, and to contribute to the country's development in science and protection of the marine environment.

The major activities of Instituto Hidrográfico are in the areas of hydrographic surveying, cartography, safety of navigation, oceanography, geology and chemistry of the marine environment. The IHPT is also a State Laboratory and is the Portuguese Hydrographic Office.

Among those activities the training provided by the Hydrography and Oceanography School stands out, with FIG/IHO/ICA category A and B courses. It is an IHPT sector dedicated to the training of the Navy officers as well as civilian technicians, from Portugal and Portuguese-speaking African countries, as well as from other friendly nations.

The most relevant information is presented in Annex Alfa.

### **2- SURVEYS**

During the period of this report no surveys were executed by IHPT on the SAIHC Region.

In the context of the collaboration with other countries, although occurred in the Eastern Atlantic Hydrographic Commission (EAHC) region, it should be mentioned the collaboration with the Republic of Cabo Verde (Cape Verde), Democratic Republic of São Tomé and Príncipe and, from Spain, Instituto Hidrográfico de la Marina (IHM).

### **3- CHARTS**

IHPT continued the implementation of CARIS Hydrographic Production Database (HPD) as the unique cartographic production system.

In addition to the Nautical Charts and the Electronic Navigational Charts, some charts for special purposes are also produced, for instance: charts for fishermen, charts for pleasure crafts, sedimentological charts and special charts for training purposes. All those charts are in accordance with IHO specifications and were very well accepted by the users.

All IHPT new charts and new editions are bilingual (Portuguese and English) and follow INT specifications, whether or not they belong to INT series.

Presently IHPT provides 100% of the national Nautical Charts using a Print-on-Demand system. PoD-charts are continuously updated according to the published “Notices to Mariners”.

#### **a. Paper Chart**

Since the last SAIHC meeting, IHPT did not produce any Nautical Chart of the region. However, IHPT is involved in the production and co-production of the following Nautical Charts:

- INT 7631 (Approaches to Beira). (3<sup>rd</sup> ICCCM Action Item 3) UK and PT to be involved for production of first INT chart version - New Scheme Proposal for INT Chart 7631 which is in evaluation by UKHO.
- INT 7645 (Porto da Topuito). (3<sup>rd</sup> ICCCM Action Item 7) MZ and PT involved in production of first INT chart based on MZ16307 - According to MZ, they are in the topographic and bathymetric data acquisition process.
- INT 7661 (Nacala). (3<sup>rd</sup> ICCCM Action Item 16) Inform Chairman of use of one or two charts to cover port and approaches - PT is in conversations with MZ regarding this Action Item. It will be possible to produce just one Nautical Chart with two plans (Approaches to Nacala and Nacala Harbour). PT proposed MZ a new scheme for INT chart of Port of Nacala.
- Other INT charts in S-11 catalogue – In evaluation.

#### **b. Electronic Navigational Chart**

IHPT is a member and participates actively in the works of the International Centre for ENC (IC-ENC), including their Technical Experts Working Groups.

Since the last SAIHC meeting Portugal did not produce any ENC of the region.

### **4- NAUTICAL PUBLICATIONS**

Since September 2015, IHPT published the Annual Group of Notices to Mariners (2016), as well as, every month, the Monthly Group of Notices to Mariners.

The third edition of the Portuguese publication 10Z01 “Símbolos, Abreviaturas e Termos usados nas Cartas Náuticas” - PN45 (INT1 “Symbols, Abbreviations and Terms used in Charts”) was published in November 2015.

Fifth edition of International Signals Code was published in June 2016.

In addition to the Tide Tables for the main harbours of Continental Portugal and Azores and Madeira Archipelagos, IHPT also publishes annually the Tide Tables to the African Portuguese Speaking Countries which includes, in the SAIHC region, the main harbours from Angola and Mozambique (see figure 1).

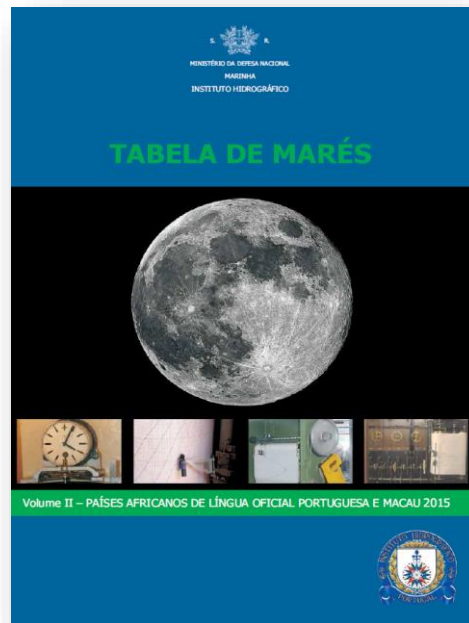


Figure 1 – Tide table for African Portuguese Speaking Countries.

## 5- **MARITIME SAFETY INFORMATION**

IHPT, as the national coordinator for the Maritime Safety Information, provides a 24h service of Navigational Warnings, in cooperation with the NAVAREA II coordinator.

NAVTEX broadcast is made both in English and Portuguese and it is transmitted from Penalva Station (near Lisbon), São Miguel Island (in the Azores Archipelago) and from Porto Santo Island (in the Madeira Archipelago).

The GMDSS coverage is not completed yet due to delays on the establishment of Digital Selective Call capability, which are expected to be solved in a near future.

Monthly, IHPT publishes the Group of Notices to Mariners, containing all permanent, preliminary, and temporary warnings in force for the corresponding period. This information, covers all navigation charts and publications of Portugal, Angola, Cape Verde, Guinea-Bissau and São Tomé e Príncipe, and is also available on the web site (<http://www.hidrografico.pt>).

IHPT on-line application ANAVNET (<http://www.anavnet.hidrografico.pt>), provides either entire NtM publications, or single NtM affecting individual documents; allowing in any case consultation and printing, including entire correction pages of nautical publications and graphical annexes to paste on charts. Regarding Navigational Warnings, ANAVNET allows consultation of warnings broadcasted by any of the Portuguese NAVTEX stations (coastal and local warnings), both in Portuguese and English languages.

Regarding Broadcast Stations (BS) from the national differential GPS network, the Continental Portugal component consists of two DGPS BS, with redundancy and integrity monitoring, located at

Cape Carvoeiro and Sagres. There are also two BS in Azores Archipelago (Horta station) and in Madeira Archipelago (Porto Santo station).

Portugal has also three AIS coastal stations in Continental Portugal and in Azores and Madeira Archipelagos.

## **6- CAPACITY BUILDING**

The cooperation of Portugal within the SAIHC region in the hydrography subject, during this report's period, was the following:

### **a. ANGOLA**

IHPT established contacts with the Director of IHSMA (Hydrographic and Maritime Signalization Institute of Angola), Angola's HO, related to the future collaboration between IHPT and IHSMA. A proposal was also presented to execute the hydrographic and topographic surveys of the most important Angolan harbours and to produce the respective Nautical Charts and ENC.

### **b. MOZAMBIQUE**

The bilateral cooperation agreement between IHPT and INAHINA is being reviewed.

Apart from the collaboration in the production of the Nautical Charts mentioned in point 3, during the period of this report, there were no other activities of collaboration with INAHINA.

It is planned to the next October, the IHPT support the INAHINA in the operationalization of the multibeam system.

## **7- OCEANOGRAPHIC ACTIVITIES**

IHPT has regular and robust activity in respect to physical, geological and chemical oceanography, participating in national and European Union research projects in those fields. IHPT is running, presently, a comprehensive network of tide gauges (17), wave and multi-parametric buoys (7), and coastal weather stations (3) and HF radar systems (to measure superficial currents and waves: 5 stations) in the Portuguese EEZ (see figure 2).

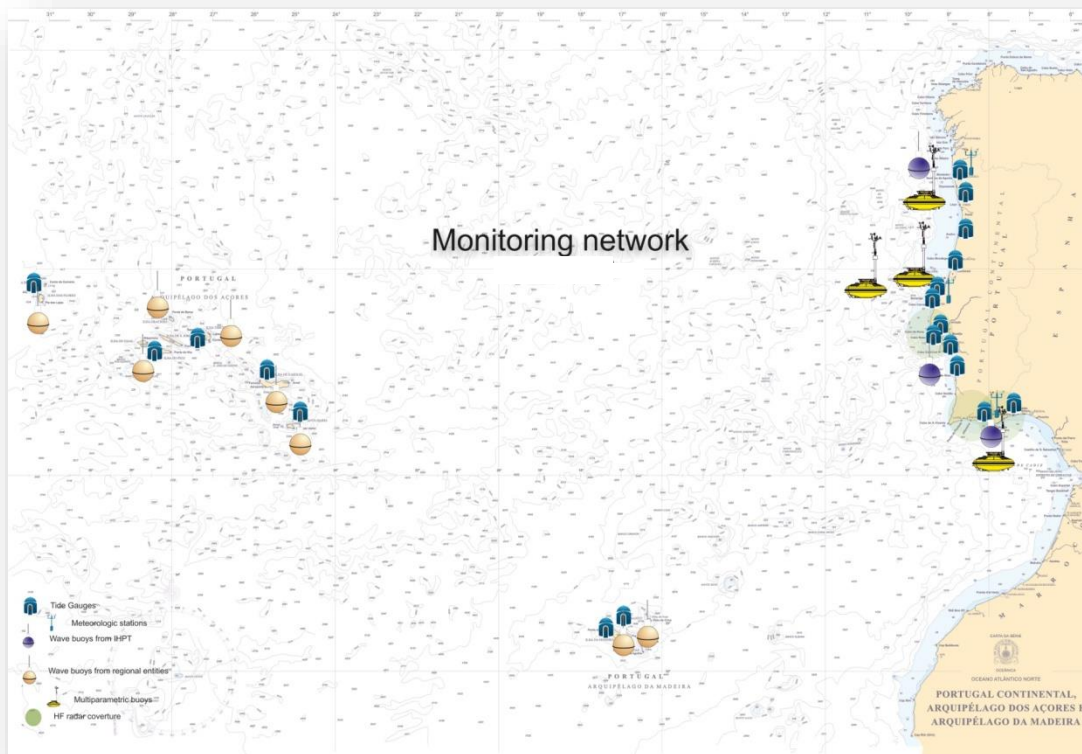


Figure 2 – Monitoring network.

## 8- OTHER ACTIVITIES

During this report's period, IHPT had the following relevant activities:

### a. Information technologies and GIS

IHPT has several portals at Internet and Intranet (hidrografico.pt) presenting information about its organization, main activities, products offered and specific geo-spatial on-line data.

The operational forecast system for sea state "Qual é a tua Onda?" continues to be maintained, depicting sea state forecasts and other generic information to the public. This information system is available to the general public, on the IHPT web portal, organized into usability sectors, such as the surf community, recreational navigation and fisheries.

Notices to Mariners and Navigational Warnings issued by the IHPT are also available at IHPT Internet portal ANAVNET, as well as general information on the Portuguese Nautical Charts and Nautical Publications.

IHPT also supports IC-ENC by providing a world ENC availability catalogue (independent of maker or distributor) to support the mariners.

## **b. Courses in Hydrography**

IHPT School of Hydrography and Oceanography provides Specialization Courses in Hydrography (FIG/IHO Category A and B).

During the period of this report attended the courses the following students:

- 2014/2015 - Cat. B, 3 militaries of the Portuguese Navy.
- 2015/2016 - Cat. A, 4 militaries of the Portuguese Navy and 6 civilians (one Brazilian).
- IHPT received a delegation of 8 military students from the Angola Navy Academy in the period 15-26 June 2015, for training in safety of navigation and a small introduction to hydrography and nautical chart production.



Figure 3 – IHPT School of Hydrography and Oceanography

## **c. Collaboration with other countries**

### Cape Verde

In the beginning of 2015, under cooperation between Portugal and Republic of Cabo Verde, a hydrographic survey team from the IHPT executed hydrographic and topographic surveys. With the collected data, a new edition of Nautical Chart 66302 was published in June 2016. We are sure it will contribute to the safety of navigation in the area.



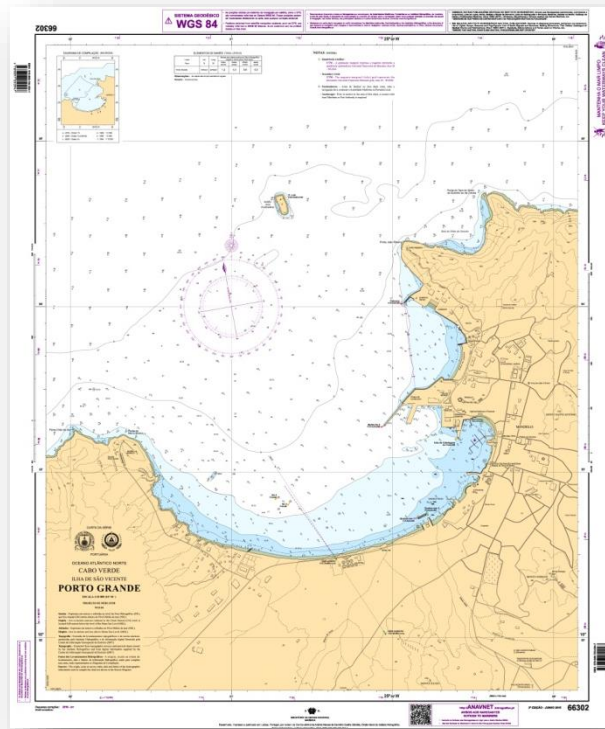


Figure 5 – Nautical Chart 66302.

### São Tomé e Príncipe

In November of 2015, two new Electronic Navigational Charts were published: PT466420 “Approaches to São Tomé and Fernão Dias Harbours” and PT568520 “Ana Chaves Bay”. This were produced based on the new Nautical Chart PT66420, that replaced the older one published in 1958, with new information acquired in 2014, under the cooperation between Portugal and the Democratic Republic of São Tomé and Príncipe. We expect it can contribute to the safety of navigation in the area and to the economic development of that country.

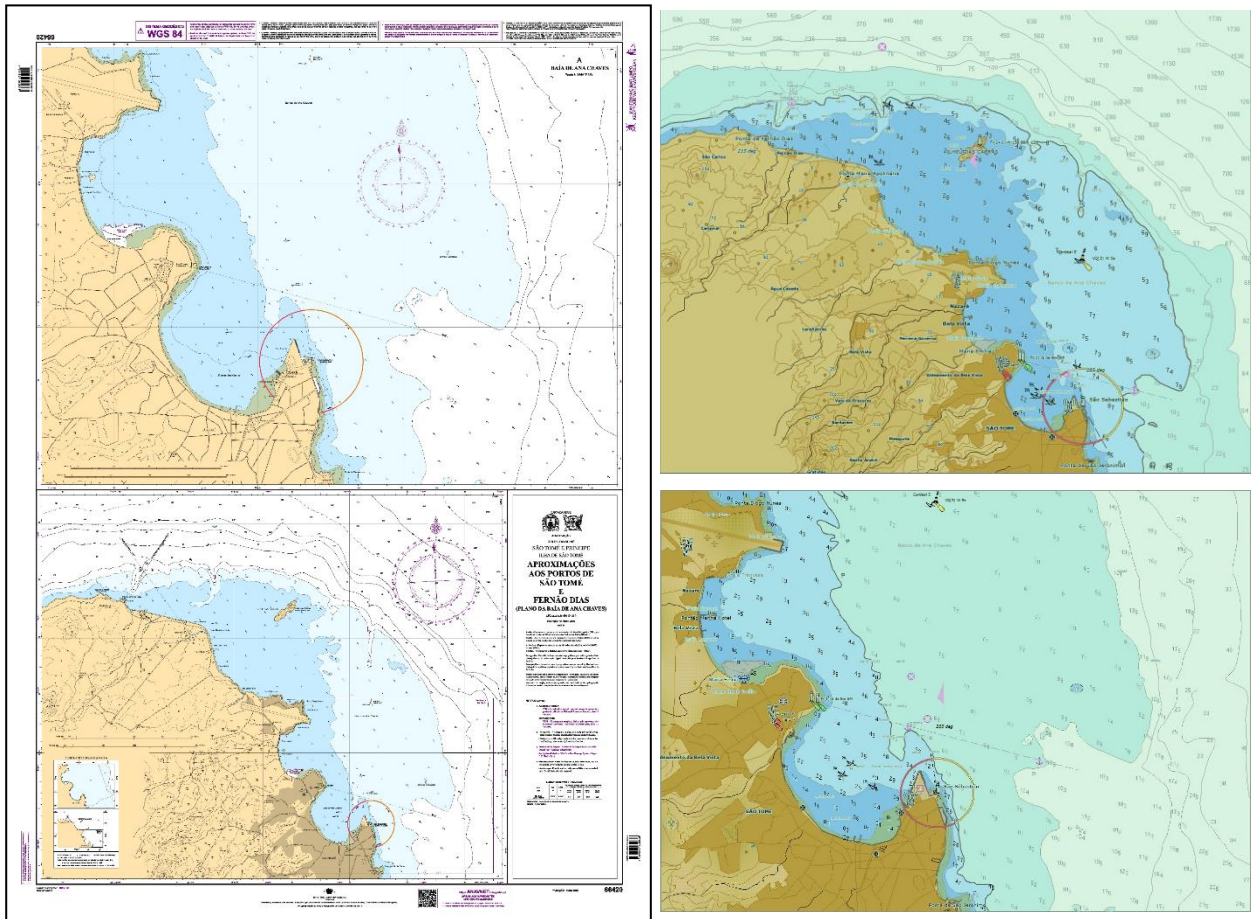


Figure 4 – Nautical Chart PT 66420 and ENC PT 466420 and PT 568520.

## Spain

Following the intensive cooperation with IHM, in June 2016 a collaborative survey was carried out involving survey teams of IHPT and IHM at the Minho River's Mouth. During the survey the difference between the Chart Datum from Portugal and that region of Spain was determined.

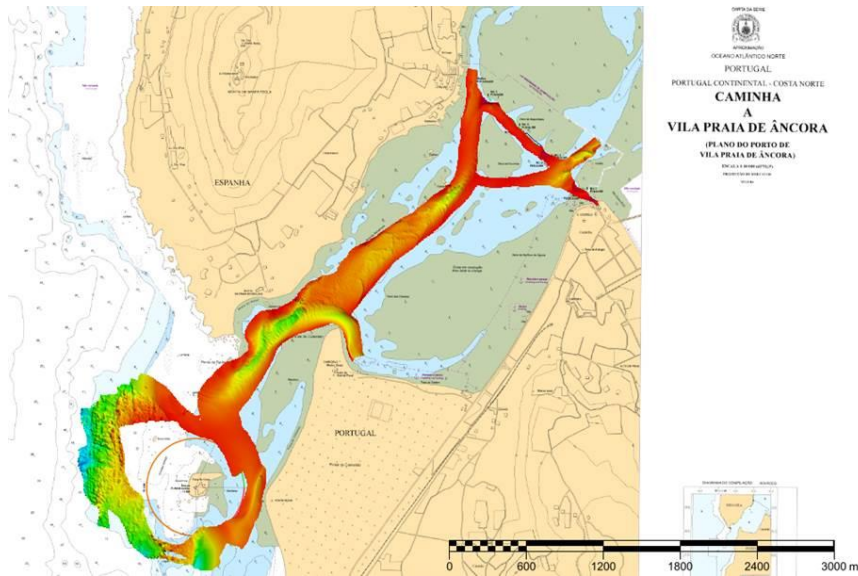


Figure 5 – Survey coverage at Minho River's Mouth

#### d. Projects

##### Douro River

At the National level, IHPT started last year a challenging project related with the hydrographic survey and the production of Nautical Charts and Electronic Navigation Charts of all Portuguese section of the Douro River. This section of the river, with about 210 Km, has five locks and very intense tourist navigation, important for the regional and country economy.

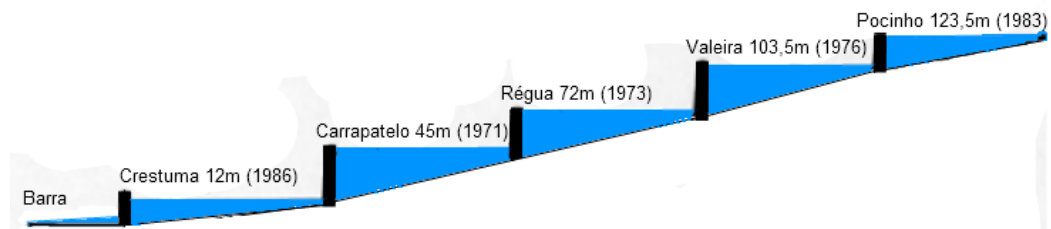


Figure 6 – Schema of Douro River Locks with their height (MSL) and construction year.

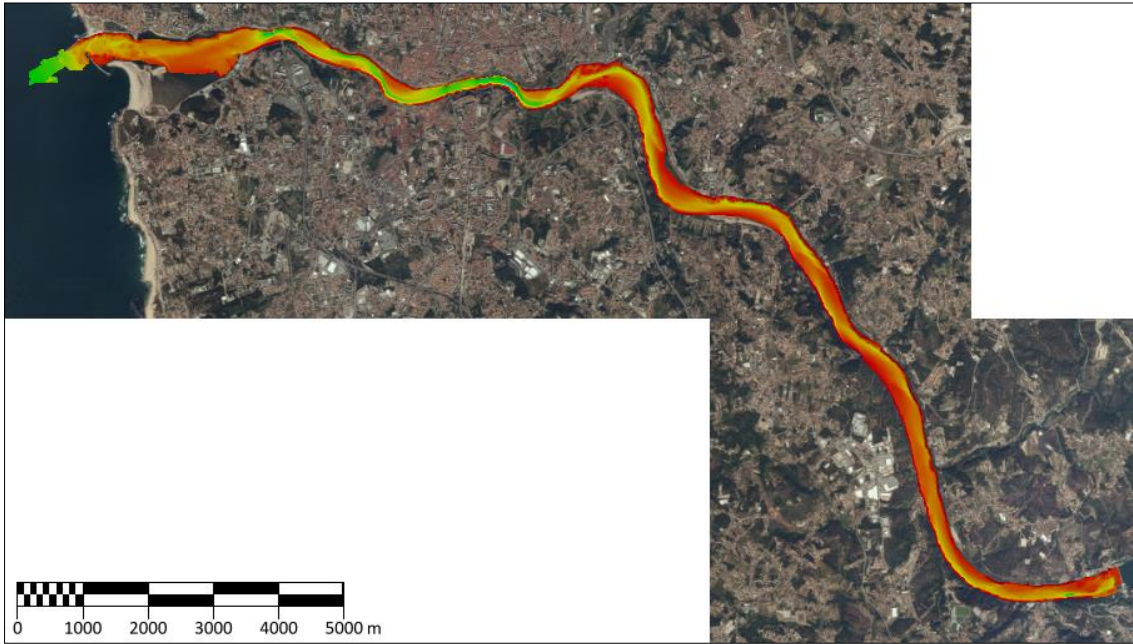
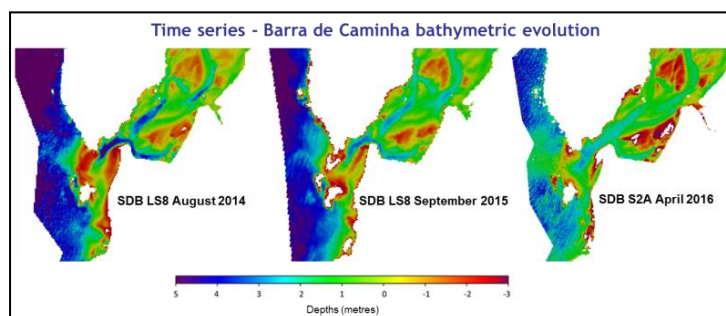


Figure 7 – Survey coverage at Douro River estuary

### **Satellite Derived Bathymetry**

Since 2015, Portuguese Hydrographic Institute has been performing some studies in Satellite Derived Bathymetry (SDB), from multispectral satellite images for shallow-waters, using Landsat 8 and Sentinel-2A images. The goal of assess bathymetry through SDB methodologies is not to directly produce nautical charts, but rather to evaluate the amount of changes since the last survey. SDB methodology has also proved to be a cost-effective tool to support nautical chart production workflow, being a very helpful tool in terms of field reconnaissance and hydrographic surveys planning, assess to bathymetric information for remote areas with cartographic interest and assess to the adequacy of bathymetric information represented on a nautical chart, allowing an evaluation of the need to update the nautical charts (for example, due to sea bottom alterations related with sedimentary dynamics or dredging actions).



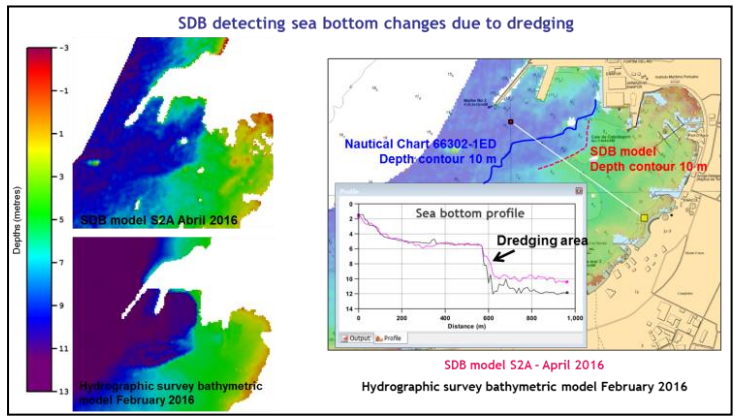


Figure 7 – Bathymetric evolution and sea bottom changes due to dredging.

**ANNEX A**

**HYDROGRAPHIC OFFICE GENERAL INFORMATION**

**PORTUGAL (PORTUGUESE REPUBLIC)**

<b>INSTITUTO HIDROGRAFICO</b> Rua das Trinas – 49 1249-093 LISBOA	
<b>Department of which the Hydrographic Office is part</b> <i>Ministère dont dépend le Service Hydrographique Ministerio del que depende el Servicio Hidrográfico</i>	Ministry of National Defence – Navy.
<b>Principal functions of the H.O. -</b> <i>Attributions principales du S.H. Principales funciones del S.H.</i>	Hydrographic Surveys, Analogue and Digital Nautical Charts, Sailing Directions, Lights and Radio Signals Lists, Notices to Mariners (monthly), Immediate Navigational Warnings, Tide Tables, Tidal Currents, Magnetic Compass Certification and Adjustment. Aids to Navigation Plans. DGPS, AIS projects. Oceanography. Provision of geophysical and environmental information for scientific and defence issues
<b>National day - Fête nationale – Fiesta nacional</b>	10 June
<b>Telephone :</b> <b>Fax :</b> <b>E-mails :</b> <b>WEB site:</b>	+ 351 21 094 3000 + 351 21 094 3299 <a href="mailto:dirgeral@hidrografico.pt">dirgeral@hidrografico.pt</a> <a href="mailto:dirtecnica@hidrografico.pt">dirtecnica@hidrografico.pt</a> <a href="mailto:hidrografia@hidrografico.pt">hidrografia@hidrografico.pt</a> <a href="http://www.hidrografico.pt">http://www.hidrografico.pt</a>
<b>Date of establishment and Relevant National Legislation –</b> <i>Date de fondation et législation nationale concernée – Fecha de establecimiento y Leyes nacionales de referencia</i>	22 September 1960 • Territorial Sea: Law n° 34/2006 • Baseline: Laws n° 2130/66 and 495/85 • EEZ: Laws n° 34/2006, n° 119/78 and n° 52/85
<b>Name and rank of the Director or Head -</b> <i>Nom et grade du directeur – Apellidos y graduación del Director</i>	Rear-admiral António Manuel de Carvalho Coelho Cândido, Director General
<b>Tonnage – Tonelaje</b>	2011 = 1,334,011
<b>Total Budget - Budget total – Presupuesto Total</b>	9 million Euros
<b>Staff employed - Effectifs – Plantilla</b>	For details, consult the WEB site: <a href="http://www.hidrografico.pt">http://www.hidrografico.pt</a>
<b>N° of charts published - Nombres de cartes publiées –</b> <i>N° de cartas publicadas</i>	219 (91 from Portuguese waters)
<b>N° of INT charts published – Nombres de cartes INT publiées - N° de cartas INT publicadas.</b> <b>N° of ENC cells published – Nombres de cellules ENC publiées - N° de células ENC publicadas.</b>	42 (35 from Portuguese waters)  91 (74 from Portuguese waters)
<b>Type of publications produced (e.g. Tide Tables, Sailing Directions, List of Lights etc.) – Type de publications produites (par ex: Tables des marées, Instructions nautiques, Livres des Feux, etc. - Tipo de publicaciones producidas (por ej: Tablas de mareas, Derroteros, Libros de Faros etc.)</b>	- Catalogue of Charts and Nautical Publications; - Catalogue of Nautical Charts of Portugal; - INT1 “Symbols, Abbreviations and Terms used in Charts”; - Tide Tables – Volume I – Portugal; - Tide Tables – Volume II – African Portuguese Speaking Countries; - List of Radio Aids and Services; - List of Lights, buoys, beacons and fog signals – Volume I – Portugal; - List of Lights buoys, beacons and fog signals – Volume II – Angola, Moçambique, São Tomé and Guiné Bissau; - List of Lights buoys, beacons and fog signals – Volume III – Cape Verde Archipelago - Sailing Directions – Continental Portugal – Volumes I to III; - Sailing Directions – Azores Archipelago – Volumes I to II;

	<ul style="list-style-type: none"> <li>- Sailing Directions – Madeira Archipelago;</li> <li>- Sailing Directions - Angola and São Tomé e Príncipe Ports Pilot;</li> <li>- Sailing Directions - Cabo Verde – Volumes I to V;</li> <li>- Sailing Directions (Pleasure Craft) – Continental Portugal (Portuguese/English).</li> </ul>		
<b>Surveying vessels/ Aircraft – Bâtiments</b> <i>hydrographiques/aéronefs – Buques hidrográficos/ Aeronaves</i> <b>D. CARLOS I</b> <b>ALMIRANTE GAGO COUTINHO</b> <b>ANDRÓMEDA</b> <b>AURIGA</b> <b>ATLANTA</b> <b>FISÁLIA</b>	Displacement	Date Launched	Crew
	2285	1989	34
	2285	1985	34
	245	1985	13
	245	1987	13
	38.7	1981	3
	38.7	1981	3
<b>Other information of interest – Autres informations utiles - Otra información de interés.</b>	IHPT School of Hydrography and Oceanography provides Hydrography and Oceanography FIG/IHO/ICA category A and B courses.		