

Organización Hidrográfica Internacional



Comisión Hidrográfica Mesoamericana y del  
Mar Caribe



# Report on the activities of the Hydrographic and Geodetic Service of the Republic of Cuba

**National Hydrography and Geodetic Office**

**2011**

## I. INTRODUCTION:



As part of the accomplishment of actions derived from previous meetings of the Mesoamerican and Caribbean Hydrographic Commission (MACHC), a request was sent out to all the member States related to the need for: a) **“...Continue to pursue the completion, in the shortest time, the questionnaire of Publication S-55, with the purpose of knowing the actual needs of the Region, through the analysis of the information therein contained and make it available to the International Hydrographic Bureau.....”** and b) **“....prepare the national presentations taking into account the questions from Publication S-55, thus making possible the updating of the information .....**”. Taking this work directive as a proposal, the SHGC has prepared this presentation for this MACHC meeting.

## II. BASIC DATA:



The Republic of Cuba is a State member of the International Hydrographic Organization since 1952, it owns an Exclusive Economic Zone of 362 900 Km<sup>2</sup> and a coastline of 2500 km determined according to the regulations of the United Nations Convention on the Law of the Sea of 1982 (UNCLOS III), which in our particular case was calculated through the longitude of a straight baselines system, from which the width of the officially recognized territorial sea is measured.

### III. HYDROGRAPHIC RESOURCES.



In Cuba the hydrographic resources are concentrated in The Cuban Hydrographic and Geodetic Service, which has 37 vessels involved in hydrographic, oceanographic and navigational aids activities. 86% of this fleet have length of 25 meters and the remaining 14% have lengths between 25 and 100 meters. The specialist human resources in hydrography have been trained in national institutions, but in order to improve and update their skills they have been attended several courses provided and funding by the IHO, Trieste Maritime International Academy, The Brazilian Hydrography Service and the UKHO.

### III. HYDROGRAPHIC RESOURCES.

At present, the staff from the SHGC dedicated to hydrographic activities consists of 30 experts with University degrees, 60 assistants for whom a curricular design was created that will allow them to become hydrographic experts of a higher level in the mediate and long future, through their participation in different courses in a national institution created for this purpose. We have more than 20 masters in related fields.



The hydrographic research in the whole national territory is carried out through the use of DGPS, using classic receptors for navigation, surveying and using OEM cards integrated to the PC's during the national surveying campaigns.

During the year, new hydrographic surveys were executed in 20 areas that cover important ports and waterways of the national territory, as well as the hydrographic compilation for the new edition of 6 nautical charts.

## IV. HYDROGRAPHIC RESOURCES.

In connection with the specified analysis, all the zone of hydrographic responsibility under the SHGC was divided in 3 depth bands, with Band I corresponding to depths lower than 50 m, Band II to depths between 51m and 200 m, and Band III for depths higher than 200 m. The result of this analysis are as follow:



- Band I has a surface of 53 720 km<sup>2</sup>, 70% (24 610 km<sup>2</sup>) of which has been properly surveyed, and a remaining 30% (10 548 km<sup>2</sup>) that needs to be resurveyed;
- Banda II has a surface of 23 439 km<sup>2</sup>, 80% (18 751 km<sup>2</sup>) of which has been properly surveyed, with a remaining 20% (4 688 km<sup>2</sup>) that needs to be resurveyed;
- Band III has a surface of 30 4303 km<sup>2</sup>, 90% (273 873 km<sup>2</sup>) of which has been properly surveyed, with a remaining 10% (30 430 km<sup>2</sup>) that needs to be re-surveyed.

## V. CARTOGRAPHIC RESOURCES, NAUTICAL CHARTS AND PUBLICATIONS.



In relation to cartographic activities, the SHGC has experimented a reduction of its human resources, a situation that has been solved with the integration of new technologies, in compliance with a transfer processed that started 2 years ago with the use of products and services from CARIS, which included new cartographic production schemas which get updated with the acquisition of new modules for surveying, processing and managing of the data under one single line of production to the cartographic creation. Under this current technology we have completed **20 nautical charts** in paper format.

With regards to ENC's we have been facing problems due to the lack of updated modules from Seven Cs, which were acquired by the country in 1996 and have not been updated. Several errors have been detected when validations are conducted using more modern tools. This has caused delays in their publication. Currently, using CARIS tools, we have completed **2 ENC cells**.

In addition, we have established a new strategy to be able to make available to the international community, before the end of 2013, our charts for the bands 1, 2, 3 and in bands 4 and 5 those corresponding to ports access and most important waterways of the country.

## **V. CARTOGRAPHIC RESOURCES, NAUTICAL CHARTS AND PUBLICATIONS. Cont.**



**The official nautical charts catalogue is comprised by 144 titles, of which 13% (5 Titles) are represented at scales lower than 1: 300 000, 19% (27 Titles) are represented at scales between 1: 300 000 and 1:100 000, 59% (85 Titles) are represented at scales between 1: 100 000 and 1: 25 000; and 19% (28 Titles) are represented at scales larger than 1: 25 000.**

**Besides that, we have more than 10 official nautical publications which are updated periodically with data obtained from the hydrographic information workflows, from survey to edition and compilation; as well as with the use of Notices to Mariners, published monthly.**



## VI. CONCLUSIONS.

To conclude with the analysis of the accomplishments of the SHGC of the parameters established in the Special Publication of the IHO S-55, we can establish the following:



1. The zone of hydrographic responsibility of Cuba is of **362 900 km<sup>2</sup>** and it does not contain non-surveyed areas.
2. 83 % of the zone of hydrographic responsibility, equivalent to **300 528 km<sup>2</sup>**, has been properly surveyed in compliance with the current requirements for the different depths bands established by the IHO; 17% of the total area needs to be resurveyed according to the new requirements. The zones requiring new surveys are mostly grouped in areas of new constructions and hydrotechnical facilities.
3. The Hydrographic and Cartographic Capacity Indicator of the Republic of Cuba is **4.85**, which evidences the degree of development of the activity in the Region.

## VII. RECOMMENDATIONS



**SHGC recognizes the importance of using national reports with the questionnaire from Publication S-55 of the IHO, due to the fact that it constitutes a guide and tool to assess the true needs of our hydrographic services and establish more efficient projections to achieve higher safety of navigation in the areas of hydrographic responsibility for each of the States of our Region.**

**DATOS BÁSICOS**

No.	Columna	Datos	Actualización
1	Nación / Área Marítima.	Cuba	<b>Cuba</b>
2	Código ISO de la Nación / Área Marítima.	CU	<b>CU</b>
3	ID. Región	NC	<b>NC</b>
4	Nación o Área Marítima	N	<b>N</b>
5	ZEE (km <sup>2</sup> x 1000)	362.9	<b>362.9</b>
6	Longitud de línea de costa	0	<b>2500 km</b>
8	Última Actualización	Septiembre 2007	<b>Noviembre 2011</b>
9	Membresía de la OHI	S	<b>S</b>



## HYDROGRAPHIC RESOURCES

### 1. Vessels by dimensions

Group	Interval	Data	Updates
<b>A (Microwaves)</b>	> 100m	0	<b>0</b>
<b>B (Tridente)</b>	De 50 a 100m	0	<b>1</b>
<b>C (Syleidis)</b>	De 25 a 50m	0	<b>4</b>
<b>D (DGPS)</b>	< 25m	0	<b>32</b>

### 2. Hydrographic staff grouped in Experts and Assistants

Hydrographic Staff	Data	Updates
<b>Especialistas</b>	0	<b>30</b>
<b>Asistentes</b>	0	<b>60</b>

### 3. Positioning methods grouped by range

Category by range	Intervals	Updates
<b>Long</b>	> 40 km	DGPS, Syleidis
<b>Mid</b>	De 5 a 40 km	DGPS, Syleidis
<b>Range</b>	< 5 km	DGPS, Syleidis



### HYDROGRAPHIC SURVEYS

The following table represents the coverage of the depths bands 1) < 50m; 2) 50 – 200m and 3) > 200m

Depths bands. (Z)	Intervals	Area (km <sup>2</sup> )	Description	Data	Updates
1	Z < 50m	<b>53 720</b>	% Properly surveyed	0	<b>70</b>
			% requires to be re-surveyed	0	<b>30</b>
			% Never been surveyed	0	<b>0</b>
2	50m < 200m	<b>23 439</b>	% Properly surveyed	0	<b>80</b>
			% requires to be re-surveyed	0	<b>20</b>
			% Never been surveyed	0	<b>0</b>
3	Z > 200m	<b>285 741</b>	% Properly surveyed	0	<b>90</b>
			% requires to be re-surveyed	0	<b>10</b>
			% Never been surveyed	0	<b>0</b>



**ANEXO No. 4**

**HYDROGRAPHIC RESOURCES**

No.	National Characteristics	Description	Data	Updates
1	Cartographic staff	Cartographers	0	7
		Editors	0	11
		Printing	0	0
2	Printing method for the Nautical charts	Black and white	0	No
		In color	0	Yes
		Others	0	Print on demand
3	Conversion to AO Format	Yes/No		Yes
4	Maximum Dimensions	mm x mm		1189 x 841



ANEXO No. 5

**NAUTICAL CHARTS**

Producing Nation:

Yes: X No: \_\_\_\_\_

Printing Nation:

Sí: X No: \_\_\_\_\_

No.	Scale (E)	Description	Data	Updates
1.	E < 300 k	Planned	0	5
		Published	0	5
2.	300 k < E < 100 k	Planned	0	27
		Published	0	27
3.	100 k < E < 25 k	Planned	0	85
		Published	0	85
4.	E > 25 k	Planned	0	28
		Published	0	28
5.	Otras	Planned	0	10
		Published	0	0

**NAUTICAL PUBLICATIONS**

No.	Publication	Update
1.	Nautical Charts	<b>S</b>
2.	Nautical Charts Catalogue	<b>S</b>
3.	Notices to Mariners	<b>S</b>
4.	Radio Warnings	<b>S</b>
5.	Routes	<b>S</b>
6.	Maritime Signals Book	<b>S</b>
7.	Symbol Manual	<b>S</b>
8.	Tide Tables	<b>S</b>
9.	Cuban Nautical Calendar	<b>S</b>
10.	Others	<b>S</b>





**SUMMARY OF THE CALCULATION OF THE HYDROGRAPHIC AND CARTOGRAPHIC CAPACITY**

**1. Indicator of the capacity per hydrographic vessel**

$$[(150 * V_1) + (75 * V_2) + (37.5 * V_3) + (12.5 * V_4)] = V_{EMB} \dots\dots\dots (1)$$

$$[(0) + (75) + (150) + (400)] = V_{EMB} = 625$$

**Where:**

- V1**      **Group A vessels with size > 100m**
- V2**      **Group B vessels with size from 50 to 100m**
- V3**      **Group C vessels with size from 25 to 50m**
- V4**      **Group D vessels with size < 25m**
- V<sub>EMB</sub>**    **Indicator of capacity for each hydrographic vessel**



**SUMMARY OF THE CALCULATION OF THE HYDROGRAPHIC AND CARTOGRAPHIC CAPACITY**

**2. Indicator of the hydrographic capacity.**

$$(1 * H_N) + (1 * E_N) + (0.01 * A_1) = C_{HID} \dots\dots\dots (2)$$

$$(1) + (1) + (0.7) = C_{HID} = 2.7$$

**Where:**

- HN*** = 1, if national hydrographers  
= 0, if non-national hydrographers
- EN*** = 1, if national hydrographic vessels  
= 0, if non-national hydrographic vessels
- A1*** % Properly surveyed for depths shallower than 50m ( $Z < 50m$ ).
- C<sub>HID</sub>*** Indicator of the hydrographic capacity



**SUMMARY OF THE CALCULATION OF THE HYDROGRAPHIC AND CARTOGRAPHIC CAPACITY**

**3. Indicator of the hydrographic capacity.**

$$(1 * C_N) + (1 * I_N) + (0.01 * P_1) = C_{CAR} \dots\dots\dots (3)$$

$$(1) + (1) + (0.7) = C_{CAR} = 2.15$$

**Where:**

- $C_N$  | = 1, if national cartographers  
= 0, if non-national cartographers
- $P_1$  | Total of official nautical publications
- $I_N$  | = 1, if national capacity for printing  
= 0, if incapable of national printing
- $C_{CAR}$  | Indicator of cartographic capacity



**SUMMARY OF THE CALCULATION OF THE HYDROGRAPHIC AND CARTOGRAPHIC CAPACITY**

**4. Indicator of combined hydro-cartographic capacity.**

$$C_{HID} + C_{CAR} = K_{HID-CAR} \dots\dots\dots (4)$$

$$2.7 + 2.15 = K_{HID-CAR} = 4.85$$

**Where:**

- $C_{HID}$  Indicator of the hydrographic capacity
- $C_{CAR}$  Indicator of the cartographic capacity
- $C_{HID-CAR}$  Indicator of the hydro-cartographic capacity

No.	Indicators	Data	Updates
1	Vessel capacity	0	625
2	Hydrographic capacity	0	2.7
3	Cartographic capacity	0	2.15
<b>NATIONAL HYDROGRAPHIC AND CARTOGRAPHIC CAPACITY</b>		<b>0</b>	<b>4.85</b>

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