

MESO AMERICAN & CARIBBEAN SEA HYDROGRAPHIC COMMISSION



# MACHC Integrated Charting Committee Proposal Standardize Regional ENC Schemes

Presented by:	Olga Bonfante Lozada, DIMAR - CIOH	
Executive Summary:	Generate INT scheme of ENCs for the region, through which international navigators have a visualization of continuous coverage, offering security and greater confidence to the end user. Standardized scheme for overview, general and coastal purposes, harmonizing cells in size, compilation scales, among others.	
Related documents:		
	Resolución de la OHI no. 1/1997 según enmendada- Principios WEND	
	CC de la OHI No. 40/2014 del 26 de mayo- Definición de Frontera Cartográfica incluida en el Anexo de los Principios WEND y Revisión de las Directivas para la Implementación de los Principios WEND;	
	CC de la OHI No. 19/2018 del 15 de febrero del 2018 – Solicitud de aprobación de una Resolución de la OHI sobre la supresión de datos ENC de solapamiento en áreas de riesgo demostrable para la seguridad de la navegación.	
	S-11 Ed. 3.1.0 Orientación para la preparación y el mantenimiento de los Esquemas de Cartas Internacionales (INTs) y de ENCs y Catálogos de cartas INT y de ENCs; y S-57 Normas de Transferencia de la OHI para Datos Hidrográficos Digitales, Apéndice B.1, Anexo A- Uso del catálogo de objetos para las ENCs (Ed. 4.1.0, enero del 2018)Clausula 2.1.8;	

## Introduction

The proposed proposal is a solution, framed in a methodology to standardize regional ENC schemes, in the purposes of overview, general and coastal navigation.

The project's approach is aimed at raising awareness of the need to design appropriate regional schemes for SOLAS users, seeking to ensure consistency, and uniform coverage through visualization in ECDIS. However, in order to avoid overlaps, gaps that need to be covered, it is important not to continue with the problems when you have the opportunity to redesign and correct the ENCs before facing the challenge of the S-101 standard among others.

## Discussion

Establish standardized schemes for the Region.

Activities, such as search and analysis of existing information on the portals of the IHO, the Regional Hydrographic Commissions and the Value Added Resellers VARs, were framed in order to verify the consistency and available cartographic coverage.

One of the reasons identified is that most CHRs do not create "Approved" ENC Schemes as they do for paper INT charts.

As of 2010, in order to avoid irregularly representing data, Colombia organized the scheme of cells for the Coastal use band rectangular and adjacent, avoiding the use of the M\_COVR, CATCOV = 2.

Disparity in the design of the existing schemes in the OHs, since there is no standardized pattern for the production of ENCs in the CHRs, which indicates that the majority of the producing countries are doing it independently, evidencing a lack of uniform coverage. For each CHR there is a diversity of designs such as: the grid system, the equivalent of paper charts, that of adjacent rectangular cells, and the combination of systems by the same producer.

Varied application of the SCAMIN attribute,

Regarding the analysis of the ENC metadata, in the CHRs, the information on the compilation scale is considered weakness, which allowed knowing the varied use of scales for navigation purposes in the region, which represents, first, Difficulty in applying the minimum display attribute to objects, second, does not guarantee a complete visualization of the coverage by means of ECDIS systems, and third, the non-compliance with the series of scales recommended by the OHI specifications.

In general, in all CHRs, the dependence on cartographic production of other countries is evident. However, this dependence is shown as a strength, due to the increasing coverage of the ports, especially for the purposes of navigation Harbor and Approach, contributing to the security and economy of the region.

Within the framework of uniform and available coverage for the region of the MACHC Mesoamerican Hydrography and Caribbean Sea commission, incomplete coverage is appreciated, due to inequality in the cartographic capabilities of the countries that make up the region, however, some areas are covered by cells produced by other countries. One case is that of the Cayman Islands, the ENCs of these islands are produced by NOAA for Overview and General purposes and by the United Kingdom Hydrographic Office for Approach and Port purposes, at 2,160,000, 1,200,000 scales, 45,000, and 8,000 respectively.

Most countries did not adopt the international paper chart scheme for each region, as a reference in the production of ENCs. Case in point, the INT Region B MACHC chart scheme was analyzed, in which Colombia and Venezuela partially used it, highlighting the following aspects:

Venezuela and Colombia neighboring countries adopted the INT paper chart scheme, the coverage of ENCs for the General purpose, is not continuous; In the area there is a cell captured by the United Kingdom Office, it does not use the limits of the INT scheme of the region.

However, in the coastal purpose, the cells present inconsistencies with respect to the adjacent depth area, where the cell of Venezuela represents an area of depth of 20m to 200m, and the cell of Colombia shows the area with a depth range of 50m to 100m.

## Proposal

According to the analysis of information in the MACHC region, a diagnosis is generated:

The first step to harmonize production is to determine fixed values of the compilation scale according to the scope of the RADAR for the corresponding navigation purpose.



Figure 1. Design of the proposed scheme for the coastal band, based on the geomorphology of the coast. Cell dimensions ( $2.9 \circ x 1.82 \circ$  tolerance +/- 20%) Compilation scale 1: 180,000

For the design of the scheme in the region, the Caribbean Sea takes into account criteria such as: Ports, independent of the activity must be covered in at least three navigation purposes;

Density of maritime traffic, for coverage the information of the layer consulted in the MICC portal, revised in November 2019, is taken as a reference.

Geomorphology of the coast.

The proposed cells are to be adjacent rectangular in order to eliminate duplication of data, avoid using the CATCOV = 2 attribute of the M\_COVR and maintain horizontal consistency.

Similarly, parameters such as cell size, series of contours to capture are established depending on the purpose of the chart.

### **Required Assembly Action**

The Assembly is invited to review and comment on:

a. The results obtained, which will be presented to the Caribbean Hydrographic Commission (MACHC) as the main input for the update of the electronic mapping scheme in the Caribbean Sea, and to the IHO to assess its relevance to serve as a guide for the updating of these schemes cartographic in other regions of the world.

b. Take other actions that may be appropriate ( for example ENC coordinator , workplan for realization, etc.)

Draft Workplan MACHC Standardize Regional ENC Scheme (MSRES)

Actions	Due date	Owner
Draft proposal MRES	Dec 2019	Columbia & MICC
Approval	Dec 2019	MACHC MS
Appoint ENC coordinator	Dec 2019	MACHC MS
Implementation by MS	Dec 2021	MACHC MS