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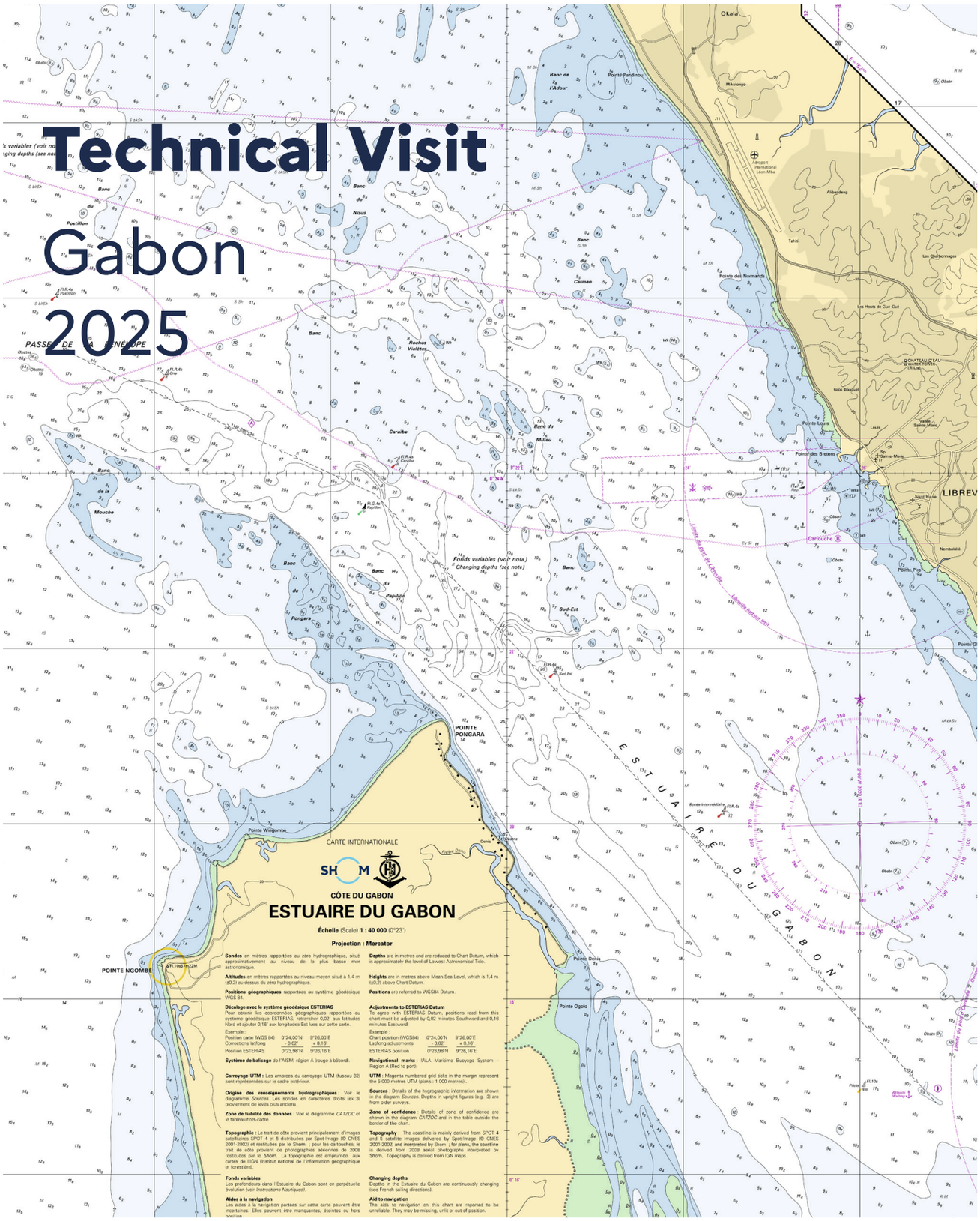
ROYAUME DU MAROC · MARINE ROYALE · DIVISION HYDROGRAPHIE OCEANOGRAPHIE CARTOGRAPHIE

IHO International Hydrographic Organization

Technical Visit

Gabon

2025



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SHOM L'océan en référence

International Hydrographic Organization
Organisation Hydrographique Internationale
IHO

ROYAUME DU MAROC · MARINE ROYALE · DIVISION HYDROGRAPHIE OCÉANOGRAPHIE ET CARTOGRAPHIE

CENTRE NATIONAL DES AIDES À LA NAVIGATION ET DE L'HYDROGRAPHIE DES VOIES NAVIGABLES · GABON

Direction des missions institutionnelles
et des relations internationales
Division relations extérieures

BREST, le 23 avril 2025

N°036/Shom/DMI/REX/NP

REPORT

SUBJECT : report of the technical visit to Gabon February 24-28, 2025.

APPENDICES : eight appendices.

This joint IHO report (Shom/France, DHOC/Morocco), Gabon (CNANHVN) integrates the own report of the National Center for Navigation Aids and Hydrography of Navigable Waterways No. 00055 /MTMM/SG/CNANHVN dated March 03, 2025.

SUMMARY

The establishment of the National Center for Navigation Aids and Hydrography of Navigable Waterways (CNANHVN) by Decree No. 0435/PR/MTMMM of 25/11/2024 concerning its creation, powers and organisation is the recent major event on which Gabon will be able to develop to gradually acquire its autonomy in hydrography and marine cartography.

This is a refoundation that will allow the scientific, technical and operational foundations for the valorisation of Gabon's sea, coast and inland waters to be restored. A necessary approach to the renewal of hydrography, physical oceanography and marine cartography in the country.

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BCRM – **Shom** – CC08 – 29240 Brest CEDEX 9
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Maritime navigation must always be made safer and more efficient along Gabon's nearly 900 km of coastline, along which are located major ports where large vessels circulate, including those dedicated to oil operations.

The challenges, in addition to navigation safety, are economic and environmental.

The economic benefits of safer and faster navigation, thanks to better hydrographic, oceanographic and cartographic knowledge, are considerable, particularly in the era of the new S-100 standards.

It should be noted that these findings are not very different from those already made in other West and Central African countries where such "IHO" technical visits have already taken place and where hydrography is often too little developed outside the limited perimeters of ports. The hydrography of all the waters under the sovereignty of the country, apart from a few occasional operations, has often not been taken up or even checked for more than half a century, even though usages at sea, their economic and environmental consequences, have evolved considerably.

Same findings, same recommendations, same answers to be sought at national, regional (IHO/EAtHC) and international (IHO) levels.

For its part, the IHO will support Gabon in:

- establishing its National Committee for Hydrography, Oceanography and Marine Cartography (CNHOCM) ;
- allowing it to be a full-fledged actor in the Eastern Atlantic Hydrographic Commission (IHO/EAtHC) ;
- more broadly, fully integrating Gabon into the IHO.

A refoundation always takes time. Some actions, such as sharing existing information and better mutual knowledge of the Gabonese parties concerned by the sea and other waterways, can be easily and quickly implemented. Others are achievable in the medium term, such as, within a bilateral framework to be established, the co-production by Gabon and France of official "SOLAS" marine charts. Knowing that the ultimate goal is to enable Gabon to achieve its full autonomy in hydrography and marine cartography.

This report proposes recommendations and actions that Gabon can take up in a specific roadmap that the CNHOCM committee mentioned above can draft. Roadmap that can provide the useful arguments for the search for the necessary means (national and international) both material and human.

The next regional conference of the IHO's EAtHC in 2026 will allow for a progress report and an exchange of experiences.

On the human and training level, it is planned to organise a seminar on the establishment of regional hydrographic schools, following up on the IHO regional seminar in Casablanca in April 2024 on the theme: "20 years of capacity building in the Eastern Atlantic region: Achievements and Prospects" and the most recent Technical Visit to Côte d'Ivoire in January 2025 on "setting up regional training courses in hydrography, physical oceanography and marine cartography in connection with the Organisation Maritime of West and Central Africa (OMAOC)".

Reporters :

IHO	Gabon (CNANHVN)
Henri DOLOU (Shom/France) Gabin Sogorb (Shom/France) Amine AMRI (DHOC/Maroc)	Madame Mariama MASSOUNGA DIALLO épse OVENG Monsieur Steve Hervé EYOUNE NZE Monsieur Hégir-Simonnet OKIROU-GUITENGA

Our thanks to :

Main actors of the Technical Visit :

Ministry of Transport and Merchant Marine (MTMM)

National Center for Navigation Aids and Hydrography of Waterways (CNANHVN)

National Council of the Sea (CNM) - Permanent Secretariat for the State Action at Sea (AEM)

National Navy (MN)

Office of Ports and Roads of Gabon (OPRAG)

Gabon Port Management (GPM)

Owendo Container Terminal (OCT)

Omar Bongo University (UOB))

National Center for Oceanographic Data and Information (CNDIO)

General Directorate of Meteorology (DGM) of the MTMM

National Agency for National Parks (ANPN)

Gabonese Agency for Spatial Studies and Observations

National Cartography Institute (INC)

With the support of :

Shom – French Hydrographic and Oceanographic Service

Hydrography, Oceanography and Marine Cartography Division of the Royal Navy (Morocco)

IHO Secretariat (Monaco)

MAIN COMMENTS, RECOMMENDATIONS: SUPPLEMENT TO THE PREVIOUS SUMMARY

Subjects	Actions
Organise and coordinate at the national level: National Committee for Hydrography, Oceanography and Marine Cartography (CNHOCM - GABON) **Within Gabon itself, promote organisational, scientific and technical exchanges between organisations that are beneficial on subjects of common interest.**	- Hydrography and marine cartography are regal activities that interest many Gabonese actors: navigation, environment, scientific research, maritime boundaries, safety, etc. - All needs must be gradually met through : • Acquisition of data at sea and on the coast (bathymetry, tides, currents, seabed nature, remote sensing, etc.). Not just ports and their access • Importance of ensuring the perennial archiving (databases) of this multi-purpose data. And their dissemination (web portals) • Production of products: marine charts compliant with IHO standards, thematic charts such as the State Action at Sea, current atlases, tide almanacs, seabed nature charts, etc. - This implies: • Knowing each other to share objectives and converge actions • To be efficient, pool resources (sea boats, scientific equipment, hydro-oceanographers, etc.), make available data known and share it among its members. - IHO[1] strongly encourages the creation of a Coordination Committee which can be built on existing structures or constituted specifically. It will be multidisciplinary (hydro-oceanographic-cartographic-navigation aids) and therefore interministerial. - Note : a working document has been communicated to the CNANHVN knowing that : • Each country organises itself in its own way. It is not necessary to proceed as broadly, especially at the beginning, as Morocco (a model which, however, already had several decades of hydrographic experience at the time of the creation of its own CHN) ; • That its constitution (text to be drafted) will depend on :

1 Reference: https://iho.int/en/miscellaneous-publications
- IHO publication M-2 : The Need for National Hydrographic Services (Version 3.0.7, June 2018) ; Chapter 2 "The national hydrographic framework" - "4. National Hydrographic Coordinating Committee and" "5. Stakeholder Ministries".

	▪ the statutory role of the CNANHVN (secretariat of the committee in particular - it is the "engine" - it is the one who "holds the reins"); ▪ a higher state authority with the capacity to make different inter-ministerial organisations work together (presidency in particular) (the MTMM was mentioned while recalling the inter-ministerial role that the CNM-AEM could have); ▪ the necessity to build up gradually, perhaps starting with the realization of concrete actions achievable in a short time, highlighting all the potential of such a committee, in particular the pooling of resources that it allows.
Roadmap	Once constituted, this **CNHOCM** will be able to meet with the first tasks being: - exploiting this IHO report - It is suggested to translate it into a roadmap with concrete actions such as: • The organisation of the collection and dissemination of nautical information (the CNANHVN being able to act as coordinator of nautical information) • Training needs (hydrography and marine cartography) all stakeholders concerned • Analysis of possible solutions • Drafting of letters (training requests, interview requests) to development agencies and embassies • Data acquisition programs at sea to resume bathymetry outside already covered areas (Ports, oil activities). This by pooling resources (boats, scientific equipment, tide gauges, specialized personnel ...) to be sought • Develop bilateral (Hydrography, Oceanography, Cartography) cooperations between countries, regional (EAtHC) and international • Creation of databases, GIS, etc - Tasks that will require strong involvement (actions and their follow-up) from the National Hydrographic Service, namely the CNANHVN.
Organise internationally and join the IHO	- the accession process (concerns the ministries in charge of maritime transport and foreign affairs) is described on the IHO website: https://iho.int/en/become-a-member-state. - You will find in particular the verbal note to be filled in.

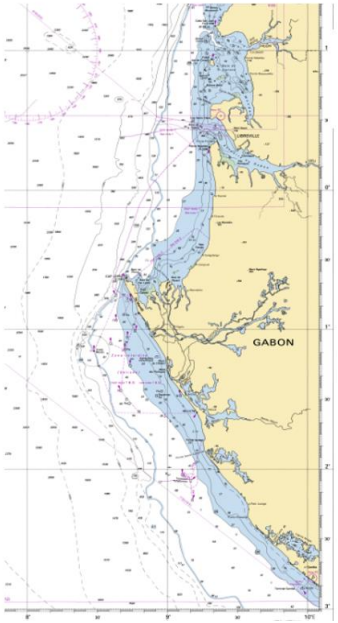
	- It is up to Gabon to determine the tonnage of its merchant fleet and that of the National Navy in order to calculate the number of shares of the country and then the amount of its annual contribution. - The amount of a share is currently set since the IHO Assembly No. 3 (May 2023) at €4,145.05.
Being present at the regional level	- As Gabon is not a member of the IHO, it is therefore not a member of the EAtHC by right. - It is currently only an "observer". - It is proposed, at a minimum (as long as it is not a member of the IHO), that it become an Associate Member of the EAtHC. - This will allow it to better participate in the work of the EAtHC: Hydrographic Commission of the Eastern Atlantic of the IHO (Eastern Atlantic Hydrographic Commission - EAtHC) and associated seminars. - Note: a working document has been communicated to the CNANHVN specifying how to prepare the signing of the statutes: • Identifying the Gabonese signatory organisation (which can be the CNANHVN) ; • Preparing the document to be signed ; • Scheduling the signing at a EAtHC event. For example, EAtHC 19 in 2026. An opportunity to shed light on Gabonese ambitions in the field of hydrography and marine cartography.
As soon as accession to the IHO has been formalized, propose Gabonese candidates for the training offered to Member States by the IHO in hydrography and marine cartography	Regularly consult the IHO Circular Letters at: https://iho.int/en/circular-letters. In particular those relating to: - Category "B" Hydrographic Survey Programme Sponsored by the Republic of Korea - Category "B" Nautical Cartographers Programme, sponsored by the Republic of Korea - IHO - Nippon Foundation Geospatial Marine Analysis and Cartography (GEOMAC) Project, UKHO, Taunton, UK - IHO-IOC-Nippon Foundation / GEBCO Training Project. Graduate certificate in Ocean Mapping

	- Master of Science Programme in Hydrographic Science at the University of Southern Mississippi (USA) Sponsored by the Republic of Korea In case of absence of candidates with the prerequisites (mathematics, physics, if applicable English) or enrollment limit, please note that these are recurring training programs to position themselves for the following year. The IHO-approved trainings to be followed are: - CAT B Hydro: senior hydrographic technicians (priority) - CAT B Carto: senior marine cartographers - CAT A Hydro: hydrographic engineer
Liaise with the French hydrographic service (Shom) : so that nautical charts are representative of real navigation conditions. Updates are imperative (SOLAS obligations)	Appendix IV indicates the "Shom" contact points: in particular Julien CORMERY Nautical Expert - Africa/Indian Ocean julien.cormery@shom.fr. Exchanges must be able to be conducted in both directions (it is up to the CNANHVN to ensure that these exchanges are above all well organised) : - From Gabon (hydrographic data producers) to Shom: sending of data (bathymetric surveys, dredging thresholds, tides, new infrastructures, permanent buoyage, limits of regulated zones such as fishing, marine protected areas, etc.), metadata (quality) and information likely to update current nautical charts and nautical instructions. This data is exclusively used to update nautical charts for navigational safety purposes ; - From Shom to CNANHVN : sharing of methods on cartographic processes Note: It is fundamental that Gabon archives and can disseminate (national databases, internet portal, etc.) all the data previously mentioned in a lasting manner for shared valorizations (multi-purpose databases: navigation, hydrography, oceanography, environment, research, etc.)
Towards Gabonese and French co-production in a perspective of autonomy	French cartography (Shom) which must become Gabonese (implies a Hydrographic Service which now exists: the CNANHVN) Initially, a Gabonese and French co-produced cartography - The autonomy process is long (Morocco for example) - The first step is to co-produce :

	• Define a framework for the progressive transfer of skills: Administrative Arrangement (co-production, provision of charts, training). The Shom via the French embassy has already provided a draft of such an arrangement (which has indeed arrived at the MTMM) • This implies having, progressively, on the Gabonese side, hydrographers and marine cartographers involved and operational • The charts could then have IHO/Gabon/France logos
Meet with international development agencies	The time available for the Technical Visit was not enough to meet with development organisations. It would now be appropriate, with the support of this report: - On the one hand, to follow up on the possibilities that such organisations could offer. This is about structuring proposals for participation in development projects that meet both the needs of the country (e.g.: reducing the costs of maritime transport) and the strategies of the agencies (e.g.: environment, poverty reduction) - Note well that it is necessary to know the projects already underway to see how to fit into them, - Development assistance requests can be drafted generically to be addressed to all international agencies present in Gabon (these agencies coordinating their actions)

OTHER COMMENTS

<table>
<tr><th>Objects</th><th>Comments – Recommendations</th></tr>
<tr><td>Maritime Safety Information at Sea (MSI)</td><td>Beyond local advice (port authorities), concerning the open sea and access to various ports, navigators must receive Maritime Safety Information. This involves collecting information (from all stakeholders: Navy, shipping companies, fishing, oil, etc.) and disseminating it via NAVAREA II. This can be organised by an inter-ministerial instruction concerning the modalities of collection and dissemination (urgent, rapid, deferred) of nautical information (MSI: Maritime Safety Information).

<table>
<tr><th>PAYS</th><th>INSTITUTION</th><th>TELEPHONE</th><th>FAX</th><th>EMAIL</th></tr>
<tr><td>France</td><td>Shom
Service hydrographique et océanographique de la marine</td><td>+33 2 56 31 24 24 24
+33 6 24 80 08 92 (spare)</td><td>+33 2 56 31 24 84</td><td>coord.navarea2@shom.fr
coord.navarea2@gmail.com (spare)</td></tr>
</table>

Le Gabon est dans la zone NAVAREA II: France Shom

Website: http://diffusion.shom.fr/navarea-en-vigueur

Explanation: Maritime Safety Information (MSI), as defined in Resolution A.705(17) of the International Maritime Organisation and detailed in the joint IHO/IOM/WMO manual on MSI (IHO Special Publication S-53), consists of the collection and dissemination of navigational and meteorological warnings, search and rescue information and other urgent safety-related information, including nautical information relating to nautical documentation.</td></tr>
</table>

	The dissemination of these MSRs is based on the Global Maritime Distress and Safety System (GMDSS), an international system that uses telecommunications for search and rescue at sea (SAR) and the prevention of maritime accidents. Moreover, RSMs in their broadest sense include updating nautical charts and other nautical publications (list of lights, radio signal books, nautical instructions, etc.). RSMs require an organisation (procedures for collecting, transcribing and transmitting information, maintained equipment, trained personnel) with a national RSM coordinator in contact with navigators, the de facto cartographic authority (France) and NAVAREA II (Shom).

HYDROGRAPHIC NATIONAL CAPABILITIES ASSESSMENT SUMMARY - TABLE

IHO	EAtHC	NHC	Phase 1 : MSI capacity	Phase 2 : Survey capacity	Phase 3 : Charting capacity
NO	NO (Observer)	NO (1)	NO (2)	OUI (limited to harbour)(3)	NO (4)

(1) National Hydrographic Committee: in the process of being established the National Committee for Hydrography, Oceanography and Marine Cartography (CNHOCM)

(2) Maritime Safety Information. NO for the open sea beyond territorial waters. Therefore, an organisation needs to be put in place to operationalize exchanges with NAVAREA II (France/Shom) and the current producer of nautical charts "SOLAS" for updates (Shom)

(3) Hydro-oceanographic surveys through the acquisition and archiving of data (capacity to comply with IHO standards not verified)

(4) NO for Charting to "SOLAS"

TABLE OF CONTENTS

1 INTRODUCTION – PROGRAMING

The visit was planned within the framework of the IHO capacity development activity program for 2025 IT:

- CBWP 2025 Action A-01 : Technical Visit to GABON

It was initiated in close collaboration with the Gabonese participants listed below
The terms of reference for the visit are recalled in Appendix II.

2 COMPOSITION OF THE TEAM

The visiting team was composed of:

For IHO:

Surname, NAME	Role
Gabin SOGORB	Capacity Development Coordinator of the EAtHC (Eastern Atlantic Hydrographic Commission) (France/Shom)
Henri DOLOU	Hydrographic Expert (France/Shom on behalf of IHO)
Amine AMRI	Hydrographic Expert (Morocco/DHOC on behalf of IHO)

For Gabon under the authority of Mr. Hilarion ONE (focal point for IHO) Director of CNANHVN :

Surname, NAME	Role
Hégir OKIROU GUITENGA	Study officer to the Director
Steve Hervé EYOUNE NZE	Head of Hydrography Service
Mrs Mariama MASSOUNGA DIALLO OVENG	Geographer Engineer/Focal Point for the creation of the National Committee for Hydrography, Oceanography and Marine Cartography

The CNANHVN also provided the necessary logistical support for travel and meetings.

PART A – OVERALL ASSESSMENT OF THE SITUATION IN THE REGION

3 EFFECTIVENESS OF THE TECHNICAL VISIT

The follow-up of the actions resulting from the recommendations drafted will make it possible to measure the real effectiveness of the visit in the long term. Milestones (based on a roadmap to be drawn up by Gabon) can be set during the next EAtHC meetings (EAtHC 19 in March 2026). It can already be said:

- That it could be prepared upstream of the trip through exchanges and analysis of existing reports and texts ;
- That the issues of hydrography, oceanography and marine cartography could be addressed in terms of science and technology, navigation and economics ;
- That the following appointments (limited to Libreville) could be honored; Appendix V specifies the main entities met :
  - CNANHVN (National Center for Navigation Aids and Hydrography of Waterways) [MTMM] ;
  - MTMM (Ministry of Transport and Merchant Marine) (Chief of Staff/Secretary General)
  - AGEOS (Gabonese Agency for Spatial Studies and Observation) [Ministry of Water and Forests in charge of environmental preservation, climate and Human-Wildlife Conflict: MEF]
  - CNM (National Council of the Sea - Permanent Secretariat State Actions at Sea) [Presidency]
  - ANPN (National Agency for National Parks) [MEF]
  - OPRAG (Office of Ports and Roads of Gabon) [MTMM]
  - GPM (Gabon Port Management)
  - OCT (Owendo Container Terminal)
  - INC (National Institute of Cartography) [Ministry of Housing, Urban Planning and Cadastre: MHUC]
  - UOB (Omar Bongo University) and CNDIO/CENAREST (National Center for Oceanographic Data and Information/National Center for Scientific Research) [Ministry of Higher Education and Scientific Research and Technological Innovation - MERSIT]
  - DGM (General Directorate of Meteorology) [MTMM]
  - MN (National Navy) [Ministry of National Defense]

A restitution and recommendation meeting was organised by the CNANHVN on the last day at the Hibiscus Hotel in Libreville.

Synthesis meeting participants

The CNANHVN organizing team including Mr. Steve Hervé EYOUNE NZE Head of the Hydrography Service and Mrs. Mariama MASSOUNGA DIALLO Wife OVENG Geographic Engineer/Focal Point for the creation of the National Committee for Hydrography, Oceanography and Marine Cartography.

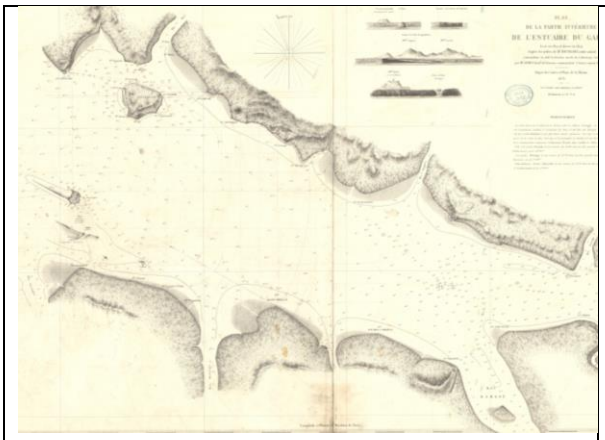
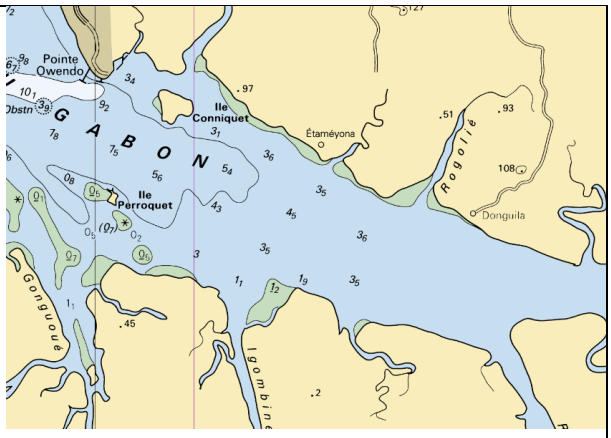
Mrs. Mariama MASSOUNGA DIALLO OVENG and Mr. Hégir OKIROU GUITENGA study officer with the Director of the CNANHVN. Moderator during the synthesis meeting

The "IHO" Technical Visit team Amine AMRI, Henri DOLOU, Gabin SOGORB and Colonel Hilarion ONE Director of the CNANHVN

International development aid organisations could not be met due to lack of time. This report can serve as a reference for future interviews, for example on coastal environments for which hydrography and cartography provide essential data and knowledge.

In addition to this report, reusable fact sheets and communication materials have been provided on:

- the issues and governance (institutional context)
- the establishment of a National Committee for Hydrography, Oceanography and Marine Cartography (CNHOCM) [email dated 03/06/2025] ;
- the signing of the EAtHC statutes in order to become an "Associate Member" [email dated 03/06/2025]
- the drafting of a Bilateral Agreement concerning in particular the co-production of SOLAS marine charts (Administrative Arrangement) [email dated 03/07/2025]

	
Archives Nautical chart 3414 **Publication of 1875** **Inland estuary Gabon**	**Nautical chart 7257** **Publication of 1995 - Corrections 2024**

The exchanges were professional and constructive. Recommendations were made. Some of them can be implemented in the short term.

It should be noted that the technical exchanges focused on the obligations of the SOLAS Convention (Chapter V) as well as the expected socio-economic benefits. In this regard, hydrographic investments can generate very substantial and even rapid financial savings, notably through:

- dredging operations minimization ;
- optimization of ship loadings ;
- welcoming new ships with higher capacities but with much more demanding dimensions in terms of navigation constraints ;
- more direct navigation routes (cabotage in particular) saving time and fuel.

4 INTERNATIONAL AND REGIONAL COOPERATION - DEFENSE

a. [International and Regional Organisations]

IHO Status	Regional Hydrographic Commission of the IHO	IMO	IALA
Not Member	EAtHC Observer	Member	Member

b. [Defence and Security Arrangements]: Subject not addressed during the visit.

PART B – GABON - EVALUATION

5 INVOLVEMENT IN THE REGIONAL HYDROGRAPHIC COMMISSION (EATHC)

Findings	Actions
In recent years, Gabon's (including GPM) participation in EAtHC meetings has been regular	- Participate in the next EAtHC (19th) plenary session in 2026 https://iho.int/en/eastern-atlantic-hc - this participation may, in the future, be expanded depending on the involvement of other Gabonese organisations in the work of the CNHOCM
	- In particular, participate in the training seminar that will take place at the same location. - Point of contact : henri.dolou@shom.fr

6 PRELIMINARY CONTACTS

The visit was prepared mainly through discussions with the CNANHVN, GPM and the Shom, as well as the collection of open information on the Internet.

The Shom was consulted in its capacity as:

- NAVAREA II Coordinator;
- EAtHC Capability Development Coordinator;
- Producer and publisher of SOLAS charts (paper and electronic);
- Coordinator of the international chart portfolio for Region G.

Shom paper charts were distributed on site.

7 TECHNICAL VISIT CONTACT POINTS - IHO (P5-YEARBOOK) AND EATHC CORRESPONDENTS

The Technical Inspection contact points are listed in Appendix IV.

The IHO publication P5 needs to be updated: this is provided in appendix VII.

Current reference for the HCI directory:

https://iho.int/uploads/user/pubs/periodical/P5YEARBOOK_ANNUAIRE.pdf

8 NATIONAL MARITIME AFFAIRS - ACTORS

The duration of the visit (5 working days) enabled us to meet key players in the maritime world in Libreville. The idea was to discover the players involved in the future National Committee for Hydrography, Oceanography and Marine Cartography (CNHOCM).

Port Gentil could not be visited due to time constraints.

Discussions focused on the challenges associated with hydrography: in addition to navigational safety (international commitments - SOLAS), socio-economic performance through port capacity for accommodating ships (including larger ships), optimising their loading (through depths shown on nautical charts and precise knowledge of tides) and even identifying shorter shipping routes that are consequently faster and more economical in terms of fuel.

It was pointed out that hydrography is an applied science dealing with the measurement and description of the physical features of seas and coastal areas. Its mastery is essential for coastal protection (coastal development), underlining the cross-cutting nature of hydrography (physical oceanography is part of it) and, consequently, its inter-ministerial ambitions at government level.

Hydrography and marine cartography concern all the waters under Gabonese sovereignty, not just ports and access to them from the open sea, so the stakes are indeed national.

8.1 MAIN ACTORS

The brief descriptions below are provided simply to give an overview of the functions of the organisations encountered and their potential for involvement in the future CNHOCM.

8.1.1 Transport - Maritime Administrations - State Action at Sea - Defence (State Institutions)

8.1.1.1 National Center for Navigation Aids and Hydrography of Waterways (CNANHVN)

CNANHVN

The CNANHVN is under the supervision of the MTMM

MTMM

References: https://journal-officiel.ga/recherche (JO N° 45 Bis of Decembre4, 2024 - hydrographie) : Decree N° 0435/PR/MTMMM of 25/11/2024 on the creation, attributions and organisation of the National Centre for Navigational Aids and Waterways Hydrography (CNANHVN).

Extracts:

Article 3: The Centre's mission [...] is to carry out hydrographic studies and surveys. To this end, it is responsible for:

- centralising, collecting, transmitting and distributing nautical information relating to navigational aids;
- producing technical publications :
  - books of lights, buoys and other signals required for navigation ;
  - radio aids to navigation ;
  - nautical charts and publications;
  - an annual Notices to Mariners guide;
  - tide tables, currents and any other nautical instruments;
- to cooperate with international organisations and bodies in the field of maritime, radio, hydrographic and hydraulic signalling;
- carrying out bathymetric studies and surveys, in collaboration with the bodies and administrations concerned;
- carrying out hydrographic studies and topographic work, in collaboration with the departments and bodies concerned;
- ensuring the installation along the coastline of hydraulic measuring equipment relating to swell, tide, current and climatic parameters, in collaboration with the administrations and other bodies concerned;

- participating in the production of nautical charts in collaboration with operators and other interested institutions;
- to ensure the updating of nautical charts in collaboration with the administrations and other bodies concerned;
- carrying out regular quality control of bathymetric surveys in port areas.

These are the responsibilities of a National Hydrographic Service.

The center has a hydrographic service

8.1.1.2 National Navy

The Navy comes under the authority of the Ministry of Defence

The Navy is one of the components of the Armed Forces whose missions are carried out in the waters under Gabonese sovereignty, which are the subject of official nautical charts.
The Navy is both a:

- A user of nautical documents. These include nautical charts showing the maritime boundaries required for surveillance and policing missions;
- A key player in the sea (open sea and coastline) with its capacity to acquire nautical information and potentially hydrographic and oceanographic data.

The presence of sailors qualified in hydrography within Navy is highly desirable for the mastery of Gabon's maritime spaces.

8.1.1.3 Sea National Council (CNM) - Permanent Secretariat for State Action at Sea (AEM)

The Sea National Council reports to the Republic President.

The council's inter-ministerial role makes it a key player in the National Comity of Hydrography, Oceanography and Cartography (CNHOCM).

8.1.2 Port activities

8.1.2.1 Gabon Ports and Harbours Office (OPRAG)

supervisory team of Gabon ports and harbours office

The Office of Ports and Harbours of Gabon is a government-owned industrial and commercial establishment.

The Office is the national port authority and its operational division is made up of:

- the Department of Studies and Works
  - which conducts prospective studies for the development of port infrastructures,
- the Port of Owendo Harbour Master's Office
  - which consists of Port Officers assisted by Port Supervisors and Port Masters, who are responsible for port safety and security.
- the Regional Management
  - which is the branch of the Office des Ports et Rades du Gabon located in the town of Port-Gentil and carries out the tasks assigned to the port authority in the Ogooué-Maritime district. All the departments at the Owendo head office are represented there in the form of departments.

8.1.2.2 Gabon Port Management (GPM)

Gabon Port Management (GPM), a subsidiary of Portek International, manages two multipurpose ports: Port Owendo, located in the country's capital, Libreville, and Port Gentil, an oil exploration and production hub located 160 km south of Libreville.

A very important feature of GPM is that it has the material and human capacity for hydrography.

Hydrographic vessel of Gabon Port Management

Gabon Port Management's hydrographic team in acquisition

8.1.2.3 Owendo Container Terminal (OCT)

Owendo Container Terminal (OCT), a subsidiary of Africa Global Logistics Gabon, operates the container terminal at the port of Owendo in Gabon.

8.1.3 Research and Development in Oceanography, Meteorology and Protection of the Marine Environment

8.1.3.1 Omar Bongo University (UOB)

UOB, CENAREST, CNDIO

The Faculty of Letters and Humanities has a Department of Environmental and Marine Geographical Sciences offering:

- degrees including :
  - Physical geography
  - Geomatics and regional planning
- Masters courses including :
  - Spatial Dynamics, Activities and Society
  - Coastal and Maritime Activities
  - Geomatics and regional planning

UOB was able to host the 'Integrated Management of Coastal and Marine Environments' (GIELM) master's degree, covering the following themes

- Management of coastal and marine environments
- Assessment and audit of coastal and marine environments
- Conservation of coastal and marine ecosystems
- Research and development in coastal and marine environments

This master's programme (last intake 2022/2023) was run jointly by the University of Douala (Cameroon), the Omar Bongo University (Gabon), the National School of Water and Forestry (Gabon) and the University of Yaoundé I (Cameroon). The Development Research Institute, the University Agency of Francophony and Gabon's National Parks Agency were the main partners supporting this training since 2016.

8.1.3.2 National Center for Oceanographic Data and Information

The National Centre for Oceanographic Data and Information is located on the premises of the Human Sciences Research Institute, a research unit of the National Centre for Scientific and Technological Research.

The Human Sciences Research Institute is a research organisation specialising in the production of knowledge in the human sciences, including Geography and Marine Sciences.

Its missions are:

- to encourage and facilitate scientific and technical research designed to promote economic and social development throughout the country;
- to contribute to economic development through research and experimental work;
- participate in training for research (and through research) and in building national scientific capacity;
- to carry out expert assessments in response to development needs and promote the results of research;
- to disseminate scientific and technical information.

Challenges:

- the promotion of scientific research in the fields of hydrography and oceanography, the complementary nature of which must be enhanced
- the potential for pooling human resources (e.g. oceanographers, data managers, etc.) and equipment (e.g. ships, on-board sea observation systems, etc.).
- shared databases (Geoportals) as part of the opening up of public data (open data) to take advantage of ICT (Information and Communication Technology)
- the participation in the National Committee for Hydrography, Oceanography and Marine Cartography

If there were to be training opportunities in hydrography (and physical oceanography), there is no doubt that oceanographers would be able to take advantage of them.

The National Center for Oceanographic Data and Information is already involved - within the framework of the National Committee for Hydrography, Oceanography and Marine Cartography - in a process of pooling resources and data.

8.1.3.3 Directorate General of Meteorology (DGM)

The Directorate General of Meteorology is a direction of the Ministry of Transport and the Merchant Navy.

Meteorologists may be interested in the work of the National Committee for Hydrography, Oceanography and Marine Cartography in the context of coastal environment studies where topographical and sea level data (tides and surges) are required, particularly for challenges of erosion or marine submersion.

8.1.3.4 National Parks Agency

The National Parks Agency is a public scientific and environmental establishment.

Gabon has a number of marine national parks, for which cartography (digital/GIS in particular), including marine boundaries, is a necessary management tool.

The National Parks Agency is responsible for:

- centralising, processing and disseminating information relating to national parks in order to provide national monitoring of park conservation indicators ;
- overseeing the management of land assets in all national parks and the exercise of administrative and judicial police powers.

8.1.4 Remote Sensing – Terrestrial Mapping – Geomatics

8.1.4.1 Gabonese Agency for Space Studies and Observations

Gabonese Agency for Space Studies and Observations (AGEOS) is a public scientific, technological and environmental establishment. The Agency's mission is to contribute to the collection, analysis and provision of data derived from spatial observation of the national territory, for the sustainable management of the environment, natural resources, land use and regional planning.

Please note that satellite data:

- provide a detailed description of the coastline on nautical charts, including baseline curves, which (along with tides) can be used to define national and international maritime boundaries (borders)
- •make a major contribution to ocean studies (space oceanography).

Satellite data operators are experts in database management and geomatics tools.
Note: depending on environmental conditions (water turbidity in particular), satellite data (water color) can be used to determine the bathymetry of coastal areas (*Satellite Derived Bathymetry*).

8.1.4.2 National institute of Cartography (INC)

The National Institute of Cartography is a commercial public establishment. It is placed under the supervision of the Ministry of Housing, Urban Planning and Cadastre (MHUC).
Its mastery of techniques such as database creation and management, and geomatics, makes of INC a complementary player to marine cartographers.

8.2 Coordination: State Action at Sea (AEM) and National Committee of Hydrography, Oceanography and Marine Cartography ((CNHOCM)

8.2.1 State Action at Sea (AEM)

State Action at Sea is under the responsibility of the National Council of Sea – Permanent secretary of State Action at Sea.

8.2.2 National Committee of Hydrography, Oceanography and Marine Cartography (CNHOCM)

See "MAIN COMMENTS, RECOMMENDATIONS: supplement to previous summary" at the beginning of the report.
Organise and coordinate at national level.

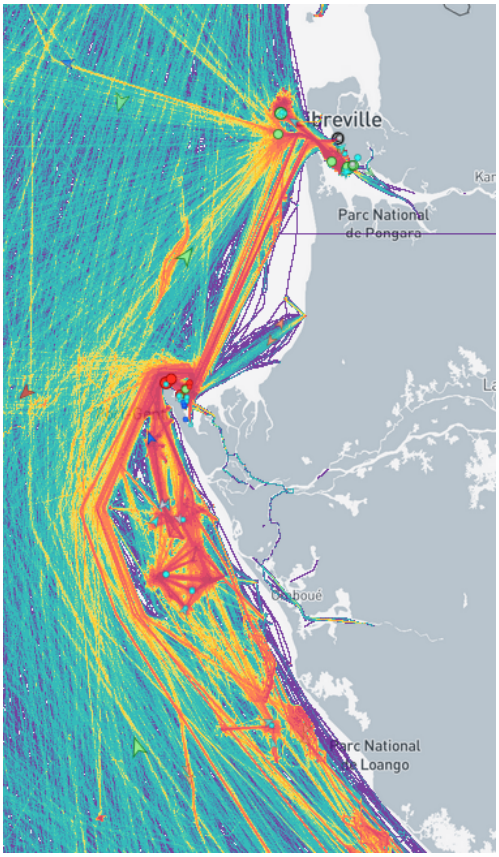
- Given the administrative sectorization, its necessity is recognized: there are many common needs, skills that can be shared and resources that can be pooled (through agreements and budgetary compensation if necessary);
- its multidisciplinary (transport/navigation, coastal environment, safety/security, maritime fishing, oil exploration, oceanography research and teaching, etc.) and interdepartmental nature was emphasized;

- note: such a committee does not, however, constitute an operational national body for hydro-oceanographic research, development and production. Such an operational body is necessary. It is a National Hydrographic Service, now represented in Gabon by the new CNANHVN. The investment required for its development (status, governance, budget, material and human resources, etc.) should not be underestimated. The establishment of operational structures and resources is shown at the "Action/Method" level in the figure below. The subject obviously needs to be discussed, at an interministerial level, between the players concerned.

9 MARITIME TRADE AND TRAFFIC – MARINE CARTOGRAPHY/CATZOC

9.1 TRAFIC MARITIME

AIS data (source: https://www.marinetraffic.com)



General situation of maritime traffic off Gabon

9.2 MARINE CARTOGRAPHY/CATZOC

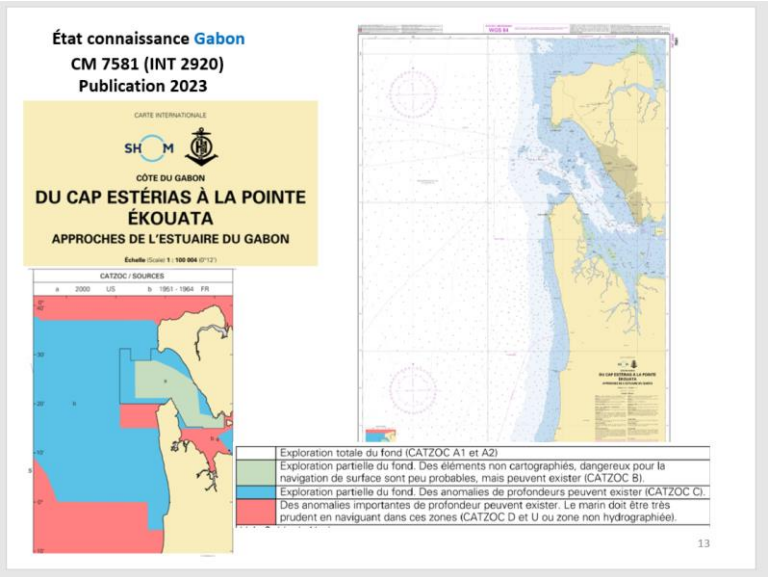
9.2.1 official cartography of Gabon (see appendix VII)

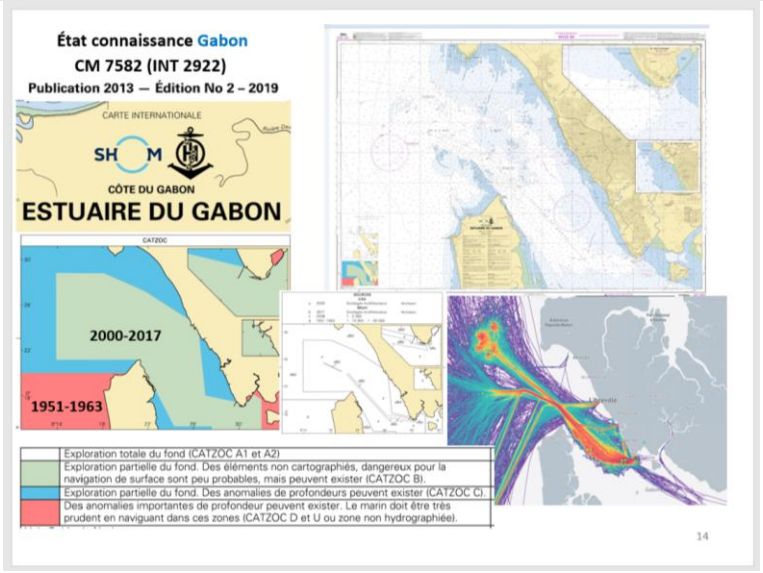
Pending greater autonomy on the part of Gabon, France acts as Primary Chart Authority through the production of nautical documentation by the Shom in Gabonese waters. This cartographic responsibility deserves to be formalised within the framework of an 'AA-SOLAS' Administrative Arrangement project between France and Gabon. This AA would also include a skill transfer training component.

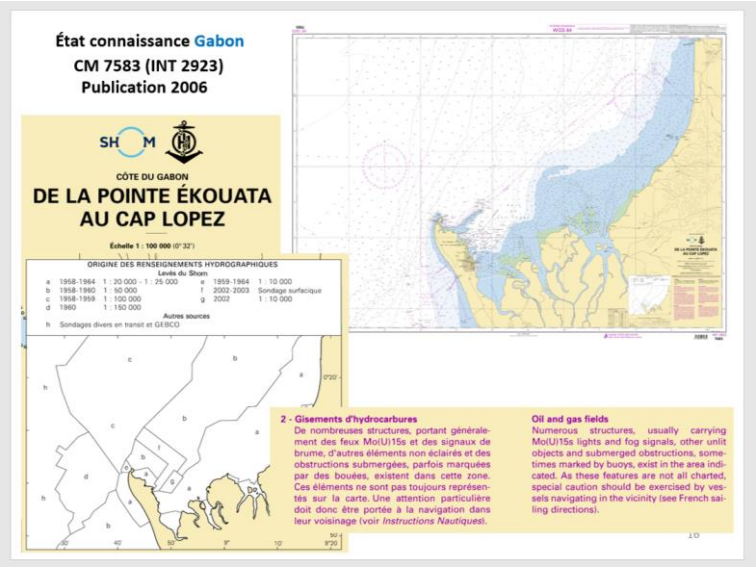
Gabonese waters are covered by a set of paper charts, digital rasters in GeoTiff format and electronic navigational charts (ENC).
These products cover the most important known navigation needs (to be verified for port projects in Mayumba).
The quality of these maps can be assessed by means of the state of knowledge described in the following chapter.
Maritime navigation (access to ports, waiting and mooring areas, quays) is fundamentally dependent on regular bathymetry updates.
These updates will only be sufficient if:

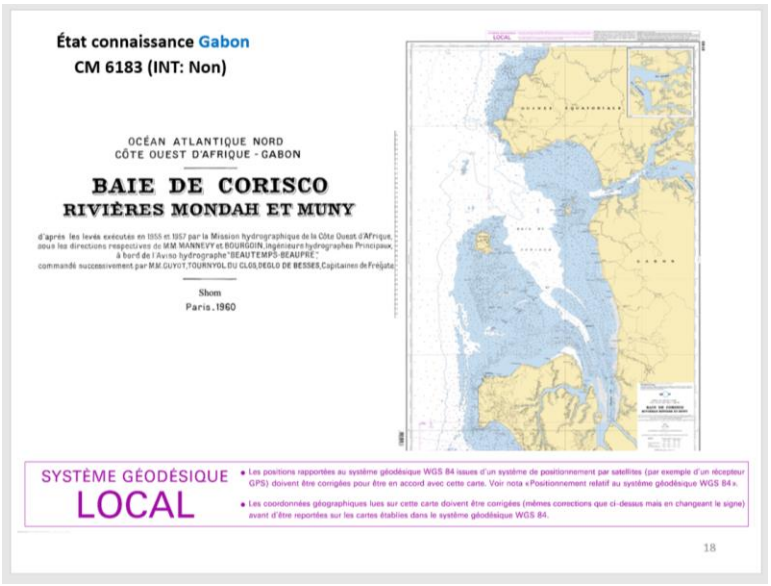
- exchanges between the Gabonese organisations or companies concerned and the Shom are regular and fluid;
- the National Centre for Navigational Aids and Waterways Hydrography acquires the capacity to acquire hydro-oceanographic data in addition to existing private port capacity.

9.2.2 STate of knowledge









Source : https://iho.int/uploads/user/pubs/cb/c-55/c55.pdf

Gabon (G)

Nautical charting / Cartographie marine / Cartografía náutica

Coverage of charts published / Couverture des cartes publiées / Cobertura de cartas publicadas	Offshore passage / Navigation au large / Pasaje offshore			Landfall and Coastal passage / Atterrissage et navigation côtière / Recalada y Pasaje costero			Approaches and Ports / Approches et ports / Aproches y puertos		
% Covered by INT or other paper charts meeting S-4 / Couvert par des cartes papier INT ou autres conformes S-4 / Cubiertas por cartas de papel INT o otras cumpliendo S-4	100	0	100	100	0	100	100	0	100
% Covered by RNC meeting S-61 / Couvert par des RNC conformes S-61 / Cubiertas por RNC cumpliendo S-61									
% Covered by ENC meeting S-57 / Couvert par des ENC conformes S-57 / Cubiertas por ENC cumpliendo S-57									
	INT	RNC	ENC	INT	RNC	ENC	INT	RNC	ENC

Paper charts showing depth in meters / Cartes papier avec les profondeurs en mètres / Cartas de papel con profundidades en metros	100 %	Paper charts referenced to a satellite datum / Cartes papier rapportées à un système géodésique satellitaire / Cartas de papel referidas a un datum satelital	100 %	Data source / Source des données / Origen de los datos	

Notes / Notes / Notas

1. Data provided by France, courtesy of Gabon.
2. Some medium scale coverage needs modernisation.
3. Data derived from EAtHC visit.

Comments:

- A joint Shom/National Centre for Navigational Aids and Waterways Hydrography check is necessary.
- There are areas where hydrographic knowledge is insufficient (very old surveys) or even non-existent (non-hydrographed areas). By correlating this knowledge with current navigation zones (including coastal navigation) and, above all, planned navigation zones, it will be possible to carry out a risk analysis and prioritise the hydrographic surveys to be carried out. Once again, this is a subject to be submitted to the coordination committee (including navigation aids).

10 RESPONSIBILITY FOR NAVIGATION SAFETY RESPONSIBILITY

From a governmental and regulatory point of view, this responsibility appears to fall within the remit of the Merchant Navy Directorate (not met during the Technical Visit) of the Ministry of Transport and the Merchant Navy.

11 RESPONSIBILITY OF THE DEFENCE FORCES (NAVY) SEE THE CHAPTER ON KEY PLAYERS/NATIONAL NAVY

As part of its responsibilities (including rescue), the Navy is involved in collecting and disseminating nautical information (Maritime Safety Information - MSI).

In order to carry out its missions (safety, security, environment), the Navy needs nautical documents: nautical charts, current atlases, maps specific to the Action of State at Sea (e.g. maritime delimitations).

The potential for national pooling of material capacities (e.g. ships that can be permanently or temporarily equipped with on-board sea observation systems, etc.) should be noted.

Its participation in the National Committee for Hydrography, Oceanography and Marine Cartography is essential.

It is essential for the Navy to have staff qualified in hydrography.

12 COSTAL ZONE MANAGEMENT AND ENVIRONMENT PROTECTION

The subject was not specifically addressed.

The management of marine protected areas necessarily involves :

- - in order to be managed (e.g. ecological monitoring), to acquire geo-referenced data at sea and on the coast (their acquisition and restitution is based on techniques shared with hydrography and cartography) ;
- - to map their boundaries.

C-55 NDICATORS

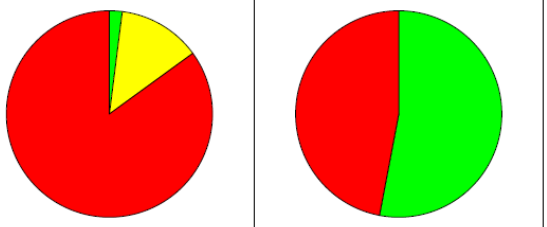
13 STATUS OF HYDROGRAPHIC SURVEYS IN THE NATIONAL MARITIME AREA

Source : https://iho.int/uploads/user/pubs/cb/c-55/c55.pdf

Gabon (G)

Hydrographic surveying / Levés hydrographiques / Levantamientos hidrográficos

Survey coverage Couverture hydrographique Cobertura hidrográfica	Depth < 200m Profondeur < 200m Profundidad < 200m			Depth > 200m Profondeur > 200m Profundidad > 200m		
Adequately surveyed Correctement hydrographié Adecuadamente levantado	2	13	85	53	0	47
Re-survey required Nécessitant de nouveaux levés Requiere nuevo levantamiento						
Never systematically surveyed Jamais hydrographié systématiquement Nunca levantado sistemáticamente						
Notes Notes Notas						



Nota:

- these indicators are based solely on data available to Shom;
- bathymetric surveys carried out as part of oceanographic research may be missing;
- data that may have been acquired as part of oil prospecting or for the study of the extension of the continental shelf beyond 200 miles should also be sought;
- however, hydrographic knowledge remains particularly poor near the coasts (including non-hydrographed areas).).

14 COLLECTING AND CIRCULATING NAUTICAL INFORMATION

The main observers at sea and along the coast (Navy, ships' captains, oceanographic research, oil companies, etc.) should provide information:

- to NAVAREA II (rapid broadcast of MSI on Inmarsat and Iridium SafetyCast Service) ;
- to Shom in order to update nautical publications in a timely manner, in particular by Notices to Mariners. Transmission should be based on a state organisation to be set up;

The flow of information should cover :

- nautical charts (e.g. new depths, dredging thresholds, new wharves, new navigational aids, wrecks removed, submarine cables, various maritime delimitations dedicated to the transport of minerals, fishing, marine protected areas, etc.);
- sailing directions ;
- light books;

- tides. The harmonic constants used for predictions need to be made more reliable and accurate using water level observations (a tide gauge is currently in operation in the port of Owendo).

15 HYDROGRAPHIC CAPACITY

Capacities have been identified at GPM.

At national level, apart from GPM, no capacity has been identified. This is a fundamental issue of sovereignty.

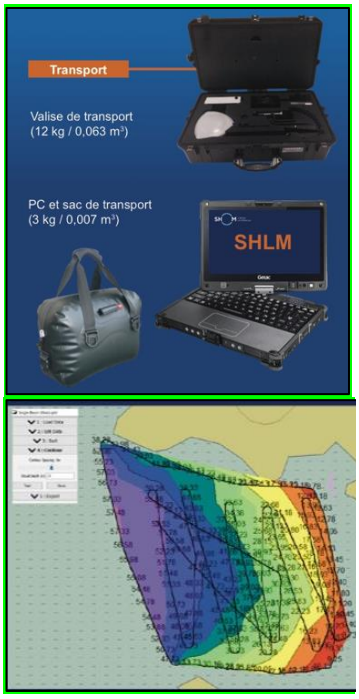
It is possible to develop an initial national capability at a lower cost with a short return on investment.

Above all, this requires organisation (see the National Coordination Committee, which could welcome, at least occasionally, companies with hydrographic capabilities), multi-purpose vessels (e.g. buoy tending and hydrography) and funding (estimated at less than €50,000 for basic on-board equipment).

This capacity consists of:

- Floating equipment (boats, inflatables). These are available from ports and the French Navy;
- an acoustic echosounder (single-beam is initially sufficient) (multi-beam systems are becoming increasingly compact and incorporate all the necessary associated sensors);
- side scan sonar to detect obstructions;
- a GPS positioning system;
- a data acquisition system (PC and specific software);
- a tide gauge and levelling equipment;
- boat-handling skills (sailors);
- human skills in hydrographic data acquisition and processing (hydrographer, geomatician).

As far as this specific equipment is concerned, there are portable integrated light systems (in cases that can be moved by car to travel between ports) that are available on the market.



16 INDEPENDENT MARINE CHART PRODUCTION CAPABILITY – TERRESTRIAL CARTOGRAPHY

Marine cartography

There is no official capacity for producing nautical charts, nor for updating and distributing them.
This is entrusted (currently without formalisation) to France (Shom).

Land cartography

The time devoted to the Technical Visit did not allow a detailed assessment of the country's land mapping capabilities.
However, capacities were identified, particularly at AGEOS and INC.
The complementary nature of land/sea mapping (coastal topography, geodetic networks, levelling/vertical references, toponymy, etc.) is highlighted here.
There are skills in location, levelling, databases, geographic information systems, toponymy and geomatics that can certainly be shared between geographers of the sea and the land. The latter have their rightful place within the CNHOCM.

Miscellaneous:

- When it comes to managing coastal risks, and more specifically marine submersion (sea level rise), hydrographers (sea level: tide, extreme levels/storm surges, changes due to climate change), meteorologists and land cartographers (Digital Terrain

Models) must necessarily cooperate (sharing of reference systems and georeferenced data).

- Data can certainly be shared for Integrated Coastal Zone Management (ICZM).
- Finally, it should be noted that the Japan International Cooperation Agency (JICA) supports many African countries in the field of land mapping.

TRAINING

17 BASIC TRAINNING FOR HIGHER LEVEL HYDROGRAPHIC TECHNICIANS (NOT ONLY)

This chapter has been written to help you draw up training plans : firstly, you need to identify your needs, find the teaching solutions you need and then implement them. It is advisable to have such plans in order to advocate and obtain targeted training.
Key IHO references ::

- https://iho.int/en/capacity-building-publications: C-47 (list of approved training courses)
- https://iho.int/en/standards-and-specifications: skills standards: S-5A (CAT A Hydrography), S-5B (CAT B Hydrography), S-8B (CAT B Cartography)

The IHO/EAtHC 18 seminar in Casablanca (Morocco) on 29 and 30 April 2024 addressed the subject: https://iho.int/en/eathc18-2024 . See the report on '20 years of capacity building within the EAtHC, Review and Prospects' and the presentations available at the bottom of the page.CONTEXT

Before embarking on a training plan, you need to be able to define what you want and under what conditions: which professions for which jobs (government, operational), in which languages (English, French, etc.), at what levels (initial and future), for which diplomas, at what cost, at what time, with which 'sponsors', etc.?
There are training courses for :

- **hydrographers** (to acquire geo-referenced data such as bathymetry and tides, which should be very useful for dredging operations) ;
- **cartographers** (geomatics);
- more **generalists** (marine sciences and technology/rivers) (hydrology, navigation, navigational aids). There are also IMO, UNESCO (IOC) and IALA training courses;
- not forgetting **support professions** (equipment maintenance, IT specialists) and **managers**, etc.

There are initial degree courses:

- CATegory B (senior technicians) (main need to master practical skills) ;
- CATegory A (engineers);
- in both cases, very solid initial training (maths, physics) is required. A good initial diagnosis is needed, because training means bridging the gap between what has been learnt and the skills objectives to be achieved.

The accredited schools (FIG-IHO-ACI) capable of awarding diplomas are in :

- France, UK, Portugal, Spain ;
- India, Japan, Korea, United States... ;
- Morocco and Nigeria may follow soon.

There are also continuing education courses.
There are face-to-face courses (which are necessary for practical purposes) and distance learning courses (or both in 'hybrid' mode).
There are :

- Fee-based training ;
- paid training (or scholarships) often within the framework of bilateral defence cooperation (France, Spain, Portugal, etc.);
- paid training (or scholarships) within an IHO framework (e.g. sponsors: Japan, Korea) for which Gabon can only apply if it is a member of IHO.

There are training courses to be pooled:

- at national level (e.g. land and sea mapping, remote sensing) for all sectors: state and private (subcontracting);
- regionally with other countries in West and Central Africa, particularly French-speaking countries.

17.2 INITIAL TRAINNIN FOR HYDROGRAPHERS

This is fundamental: having hydrographers in sufficient quantity and quality at the right time, in the right place and on a permanent basis.
According to the information gathered, Gabon only has one hydrographic officer trained in Bordeaux and Brest (1998). He is Bertrand Lele from GPM.
Hydrographer training:

- The recommended training is that offered by schools whose programmes are approved by the FIG/IHO/ACI (International Federation of Surveyors, International Hydrographic Organisation, International Cartographic Association) with Category B (CAT B).
- A list of approved programmes can be found at: https://iho.int/en/education-programme-recognition-0. There are many programmes in English, French, Portuguese and Spanish.
- For French, the Shom 2025 training catalogue (including contacts) is available at https://www.shom.fr/fr/nos-activites/formation. This is a Bachelor's level 3 course, requiring a high level of initial knowledge in mathematics and physics. It can be taken by young people who already have experience in geomatics, geodesy, physical oceanography or even maritime navigation.
- This training will provide sufficient versatility to meet almost all the skill requirements for data acquisition in the field. On their return home, CAT B hydrographers will be able to train the 'assistant hydrographers' that the country needs ('CAT C').
- For hydrographers who have to specify or carry out dredging operations, the practical training which supplements the theoretical training provided by the schools will be carried out in an organisation (e.g. port, river) which itself carries out dredging operations and has a hydrography department.

Note: human investment must be accompanied by investment in sufficiently recent operational equipment so that trained personnel can put their knowledge into practice immediately after training.

17.3 INITIAL TRAINNING FOR CARTOFRAPHERS

This is another important objective.
Category B training (CAT B) is also recommended.

List of approved programmes (fewer than in hydrography) on:
https://iho.int/en/education-programme-recognition-0
There are several English-language programmes and one in French (Shom - see the catalogue mentioned above).

17.4 ALSO POSSESS "SUPPORT" AND "MANAGERIAL" SKILLS - APPLY

Once trained, personnel will have to quickly put their theoretical knowledge into practice (school) and then validate their practical qualification after two years: in other words, move on to operational work by conducting surveys operated by cartographers or specialists in the maritime or river environment.
It also reiterates the importance of:

- the 'Support' function, with specific equipment (GPS, depth sounders, tide gauges, etc.): maintaining equipment in operational condition (MCO), IT (software, databases, data distribution portal, webmaster, etc.).
- the 'management' function, which will be very important for the overall coordination of the development of hydrography and marine cartography in the country at national level (inter-agency):
  - exhaustiveness of the needs (to be planned) to be met (navigation, coastal development, coastal protection, etc.); Definition of the corresponding products (charts in particular);
  - identification of all the stakeholders (public and private) who have an interest in cooperating to derive benefits (they join forces to pool capacities);
  - definition of the production systems to be implemented: hydro-oceanographic, cartographic and support (logistics) functions;
  - definition of the means of intervention at sea (boats, craft) ;
  - definition of onshore infrastructures for data processing and archiving ;
  - definition of governance (supervisory bodies, contracts of objectives and means, and therefore funding, agreements);
  - definition of human resource requirements in terms of quantity and quality for all structures and all professions;
  - definition of financial requirements..

18 ONGOING TRAINING IN HYDRO-OCEANOGRAPHY - CARTOGRAPHY AND RELATED ACTIVITIES (NAVIGATIONAL AIDS, PORT INFRASTRUCTURES, COASTAL PROTECTION) - MANAGEMENT

International hydrography

In reality, there are many opportunities and facilities for maintaining your knowledge of hydrography. But you need to know about them and be encouraged to follow them. Here are a few possibilities:

- IHO:
  - which offers training materials at: https://iho.int/fr/publications-sur-le-renforcement-des-capacites. In particular, there is a high-quality hydrography manual;
  - which organises seminars. The EAtHC organises regular seminars. (https://iho.int/en/eastern-atlantic-hc)
- Shom (https://www.shom.fr/), in addition to the statutory training courses offered by its school (CAT B), also provides opportunities for training in tide gauging (https://www.sonel.org/);
- AFHy: Association Francophone d'Hydrographie (https://www.afhy.fr/), a French-speaking association of hydrographers, particularly for port and river hydrographers.

Note: There is a need for regional training schools (West and Central Africa) in hydro-oceanography-mapping. We need to move away from the current situation where there is no alternative but to enrol the staff to be trained in hydrography schools outside the African continent. These schools could be French or English speaking. The contacts that IHO has been able to make so far in West and Central Africa now make it possible to identify the structures (schools, academies, etc.) that are prepared in the long term to host approved training courses for hydrographers and cartographers. These include:

- two national hydrographic services - capable of offering complete IHO/ACI/FIG (CAT B) approved training courses - which have recently considerably increased their hydro-oceanographic capabilities, namely:
  - Nigeria: NNHO (Nigerian Navy Hydrographic Office), which has a school in Port Harcourt (NNHS: Nigerian Navy Hydrographic School);
  - Morocco: DHOC (Division Hydrographie, Océanographie et Cartographique) of the Royal Navy in conjunction with ISEM (Institut Supérieur d'Études Maritimes) ;
- two maritime education centres, under the auspices of the OMAOC, which could also set up accredited training courses :
  - RMU (Regional Maritime University) in Accra (Ghana) ;
  - ARSTM (Regional Academy of Maritime Sciences and Techniques) in Abidjan (Côte d'Ivoire), which has just been visited by IHO and OMAOC. See https://iho.int/en/capacity-building-assessment: 2025 / Ivory Coast / EAtHC/EAtHC / Training Center and International Cooperation Agency Visit

APPENDIX I TO THE REPPORT N°036/SHOM/DMI/REX/NP DATED 23/04/2025

ABBREVIATIONS

AEM	Action de l'État en Mer *State action at sea*
AFD	Agence Française de Développement
AGEOS	Agence Gabonaise d'Études et d'Observation Spatiales
ANPN	Agence Nationale des Parc Nationaux
AtoN	*Aids to Navigation*
CBSC	*Capacity Building Sub-Committee (IHO)* Sous-comité de renforcement des capacités (IHO)
CBWP	*Capacity Building Work Programme (IHO)* Programme de travail de renforcement des capacités (IHO)
CENAREST	Centre National de la Recherche Scientifique
CNANHVN	Centre National des Aides à la Navigation et de l'Hydrographie des Voies Navigables
CNHOCM	Comité National d'Hydrographie, d'Océanographie et de Cartographie Marine
CNDIO	Centre National de Données et de l'Information Océanographiques
CNM - AEM	Conseil National de la Mer Secrétariat Permanent Actions de l'État en Mer
DGM	Direction Générale de la Météorologie
DGMM	Direction Générale de la Marine Marchande
DHOC	Division d'Hydrographie, d'Océanographie et de Cartographie marine de la Marine Royale (Maroc)
DUE	Délégation de l'Union Européenne
EAtHC EAtHC	*Eastern Atlantic Hydrographic Commission (IHO)* Commission Hydrographique de l'Atlantique Oriental (IHO)
ECDIS	*Electronic Charts Display Information System*
EEZ	*Exclusive Economic Zone*
ENC	*Electronic Navigational Chart* Carte électronique de navigation
FLSH	Faculté des Lettres et Sciences Humaines (UOB)
GIELM	Gestion intégrée des environnements littoraux et marins (Gabon, Cameroun)
GMDSS SMDSM	*Global Maritime Distress and Safety System* Système Mondial de Détresse et de Sécurité en Mer
GPM	*Gabon Port Management*
GSEZ	*Gestion Spécial Economic Zone*
IALA	*International Organisation for Marine Aids to Navigation*
IHO IHO	*International Hydrographic Organisation* Organisation Hydrographique Internationale
IMO OMI	*International Maritime Organisation* Organisation Maritime Internationale
IMSAS	*IMO Member State Audit Scheme*
INC	Institut National de Cartographie
IOC COI	*Intergovernmental Oceanographic Commission* Commission Océanographique Intergouvernementale

IRD	Institut de recherche pour le développement (France)
JICA	*Japan International Cooperation Agency*
LAGRAC	Laboratoire de Géomatique, de Recherche Appliquée et de Conseil (UBO/FLSH)
MAE	Ministère des Affaires étrangères chargé de l'intégration sous-régionale et des Gabonais de l'étranger
MAEP	Ministère de l'Agriculture, de l'Élevage, et de la Pêche
MDN	Ministère de la Défense Nationale
MEF	Ministère des Eaux et Forêts chargé de la Préservation de l'Environnement, du Climat et du Conflit Homme-Faune
MESRSIT	Ministère de l'Enseignement supérieur et de la Recherche scientifique et l'Innovation Technologique
MHUC	Ministère de l'Habitat, de l'Urbanisme et du Cadastre
MOWCA OMAOC	*Maritime Organisation of West and Central Africa* Organisation Maritime de l'Afrique de l'Ouest et Centrale
MP	Ministère du Pétrole
MSDI	*Maritime Spatial Data Infrastructure* Infrastructures de données spatiales maritimes
MSI RSM	*Maritime Safety Information* Renseignement de Sécurité Maritime
MTMM	Ministère des Transports et de la Marine Marchande
NAVAREA	*NAVigational AREAs (WWNWS) Zones de navigation (SMAN)* *NAVAREA national coordinator: responsible for dissemination of MSI*
NC CM	*Nautical Charts* Carte marine
NHC CNH	*National Hydrographic Committee* Comité National Hydrographique
NOIP	*New Owendo International Port*
NtMs	*Notice to Mariners* Avis aux navigateurs
OCT	*Owendo Container Terminal*
OPRAG	Office des Ports et Rades du Gabon
PCA	*Primary Charting Authority* Autorité cartographique principale
PMAWCA AGPAOC	*Port Management Association of West and Central Africa* Association de Gestion des Ports d'Afrique de l'Ouest et du Centre
RHC CHR	*Regional Hydrographic Commission (EAtHC)* Commission Hydrographique Régionale (EAtHC)
Shom	Service hydrographique et océanographique de la marine (France) *French Hydrographic and Oceanographic Service*
SMAN	Système mondial d'avertissement de navigation *Worldwide Navigational Warning Service (WWNWS)*
SMDSM	Système mondial de détresse et de sécurité en mer ***G**lobal Maritime Distress and Safety System (GMDSS)*
SOLAS	*[United Nations] Convention for the Safety of Life at Sea* Convention pour la sauvegarde de la vie humaine en mer
SSM	Service de Signalisation Maritime (Gabon)
UOB	Université Omar Bongo (Libreville)

APPENDIX II TO THE REPPORT N°036/SHOM/DMI/REX/NP DATED 23/04/2025
TERMS OF REFERENCE FOR THE REGIONAL HYDROGRAPHIC COMMISSION VISITING TEAM

International Hydrographic Organization IHO Organisation Hydrographique Internationale	**Technical visit to Gabon Action A-01 of *Capacity Building Working Programme* 2025**

Context

The IHO Capacity Building Program aims to coordinate the development of member and associate states' capacities in the field of hydrography and marine cartography in order to meet IHO's objectives and obligations under Chapter V of the SOLAS Convention and the United Nations Convention on the Law of the Sea.

In particular, IHO has decided to promote regional cooperation in West and Central Africa within the framework of EAtHC: the Eastern Atlantic Hydrographic Commission.

Specifically, IHO proposes to conduct a Technical Visit to the EAtHC "observer" country of Gabon (according to the IHO directory, in 2024, representation provided by the Service National de Signalisation Maritime). Priority would be given to meeting national players in charge of maritime navigation safety, hydrography, cartography, the coastal environment and marine-related training. In general, the blue economy and government action at sea.

Objectives

The general objectives of the technical visits are to

- discussions with the decision-making authorities of the country visited, highlighting the importance of hydrography for coastal states and therefore the need to include hydrographic activities and associated marine cartography in national plans;
- support for the development of a national system for the collection and use of maritime safety information (MSR) integrated within the World-Wide Navigational Warning Service (WWNWS);
- assessing national capacities for planning and implementing the collection and use of hydrographic data to enable the production and updating of nautical documentation essential for safe navigation and in support of other uses (infrastructure management, environmental protection, security, blue economy, etc.);
- drawing up recommendations with the players in the country visited in order to strengthen these capacities in a sustainable manner;
- preparing IMO audits (IMSAS) and following up recommendations in conjunction with the hydrographic services;
- encourage the emergence of development projects in the field of hydrography and marine cartography in liaison with the IHO secretariat and funding agencies in order to ensure that capacities are put in place on a long-term basis.

Report

A report (in French and English) on the activities and recommendations of the visiting team will be drawn up at the end of the mission.

For HIO, December 02, 2024

Gabin SOGORB

EAtHC Capacity Development Coordinator

APPENDIX III TO THE REPPORT N°036/SHOM/DMI/REX/NP DATED 23/04/2025

SOLAS REQUIREMENTS (CHAPTER V, REGULATIONS 9 AND 4)

Extracts from the M2 publication (Version 3.0.7 - June 2018)
'THE NEED FOR NATIONAL HYDROGRAPHIC SERVICES
International obligations for the provision of hydrographic services

In July 2002, the revised Chapter V of the International Convention for the Safety of Life at Sea (SOLAS) entered into force.
Regulation 9 of Chapter V of the SOLAS Convention defines very clearly which hydrographic services must be provided by contracting governments. The provision of these hydrographic services is, in effect, an obligation on contracting governments under international treaty law.

CHAPTER V OF THE SOLAS CONVENTION - RULE 9: Hydrographic services

1 The Contracting Governments undertake to make arrangements for the collection and compilation of hydrographic data and for the publication, distribution and maintenance of all nautical information necessary for the safety of navigation.
2 The Contracting Governments undertake, in particular, to co-operate in providing, as far as possible, the following navigational and hydrographic services in the most appropriate manner to facilitate navigation:

2.1 to ensure that hydrographic surveys are carried out in such a way as to meet, as far as possible, the requirements of safe navigation;
2.2 prepare and distribute nautical charts, sailing directions, lighthouse books, tide books and other nautical publications, as appropriate, which meet the needs of safe navigation; and
2.3 issue notices to mariners to ensure that nautical charts and publications are, as far as possible, kept up to date;
2.4 provide data management facilities to support these services.

3 The Contracting Governments undertake to ensure that charts and nautical publications are as uniform as possible and to take into account, as far as possible, the relevant international resolutions and recommendations*.
4 The Contracting Governments undertake to co-ordinate their activities as far as possible in order to ensure that hydrographic and nautical information is available on a world-wide basis in as rapid, reliable and clear a manner as possible.
* Refer to the appropriate resolutions and recommendations adopted by the International Hydrographic Organisation.

Regulation 4 of Chapter V of the SOLAS Convention imposes an obligation on contracting governments to ensure that appropriate navigational warnings are issued.

CHAPTER V OF THE SOLAS CONVENTION - RULE 4: Navigational warnings
Each Contracting Government shall take all necessary measures to ensure that information concerning any danger received from any reliable source is promptly brought to the notice of the persons concerned and communicated to the other Governments concerned. *
* Refer to the IMO/IHO World-Wide Navigational Warning Service Guidelines adopted by the Organisation in Resolution A.706(17), as amended.

APPENDIX IV TO THE REPPORT N°036/SHOM/DMI/REX/NP DATED 23/04/2025

MAIN CONTACTS

APPENDIX IV-1 : GABON

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MTMM	**Ministère des Transports**	**et de la Marine Marchande**	
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EKOUMA NTOMA Armand	Agent	066 37 68 05	
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MTMM/DGMM	**General Directorate**	**Of the Merchant**	**Navy**
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MTMM/DGM	**General Directorate**	**of**	**Meteorology**

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MAE	**Ministry of**	**Foreign**	**Affairs**
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MEF	Ministry of Water and Forests in charge	of Environmental Preservation,	Climate and Human-Wildlife Conflict
Roger AZIZET	Director of Nature Protection	07 70 89 531	
AGEOS	Gabonese Agency	for Space Studies	and Observation
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MESRSIT	Ministry of Higher Education,	Scientific Research and Technological Innovation	and Technological Innovation

UOB	**Omar Bongo University**		
CENAREST	**National Centre**	**for Scientific**	**Research**
CNDIO	**National Centre for**	**Oceanographic Data**	**And Information**
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INC	National Institute	of	Cartography
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Honorat OPAPE AMBOUROUE	Port Captain		
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Franck Junior OKENET	Geoscience engineer		fokenet@gpmgabon.com
OCT	**Owendo Container Terminal**		
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Yacine KANE	Director of Infrastructure	062 16 90 30	yacinekane@oct-gabon.com

APPENDIX IV-2 : OHI/SECRETARY – FRANCE - MAROC

First name - Last name	Function	Tél	Mail
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IHO	**Secrétariat**		
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Shom	**France**	**(+33)**	
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APPENDIX V TO THE REPPORT N°036/SHOM/DMI/REX/NP DATED 23/04/2025

AGENDA - EVENTS

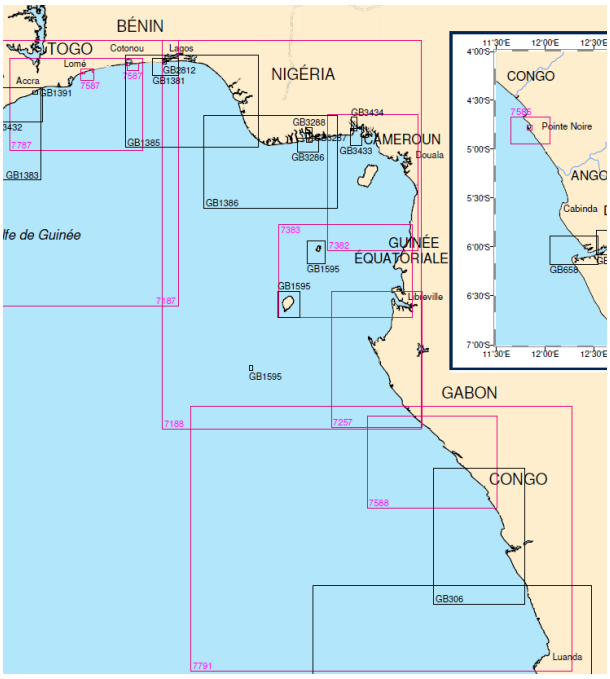
Dates - Events
D1: Monday 24 February 2025
CNANHVN (National Centre for Navigational Aids and Waterways Hydrography) [MTMM] View of the site of the Centre's future headquarters in the Oloumi district.
MTMM (Ministry of Transport, the Merchant Navy and the Sea) (Director of Cabinet/Secretary General)
D2: Tuesday 25 February 2025
AGEOS (Gabonese Space Studies and Observation Agency) [Ministry of Water and Forests responsible for environmental protection, climate and human-wildlife conflict : MEF]
CNM (National Maritime Council, Permanent Secretariat for State Action at Sea) [Presidency]
ANPN (National Parks Agency) [MEF]
D3: Wednesday 26 February 2025
OPRAG (Gabon Ports and Harbours Office) [MTMM]
GPM (Gabon Port Management)
OCT (Owendo Container Terminal)
INC (National Institute of Cartography) [Ministry of Housing, Town Planning and Land Registry: MHUC]
D4: Thursday 27 February 2025
UOB (Omar Bongo University) and CNDIO/CENAREST (National Oceanographic Data and Information Centre / National Centre for Scientific Research) [Ministry of Higher Education, Scientific Research and Technological Innovation – MERSIT]
DGM (Directorate General of Meteorology)
MN (Navy) [Ministry of National Defence]
D5: Friday 28 February 2025
Summary meeting of the week: all stakeholders concerned, organisations meeting to summarise the week. Drafting and validation of recommendations, actions, etc. Communication actions

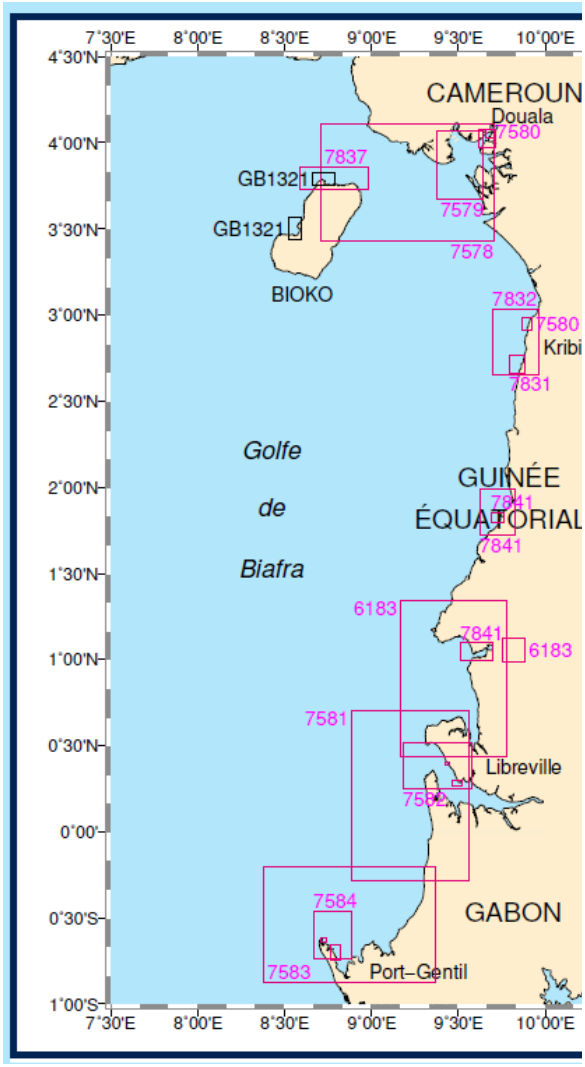
APPENDIX VI TO THE REPPORT N°036/SHOM/DMI/REX/NP DATED 23/04/2025

MARINE CARTOGRAPHY (PAPER AND ÉLECTRONICAL)

Sources :
https://diffusion.shom.fr/cartes/cartes-marines.html
https://diffusion.shom.fr/searchproduct/product/configure/id/202
(to download the Shom chart catalogue)
https://primar.ecc.no/primar/portal/cc/mapClient.jsf

Paper and GeoTiff nautical charts

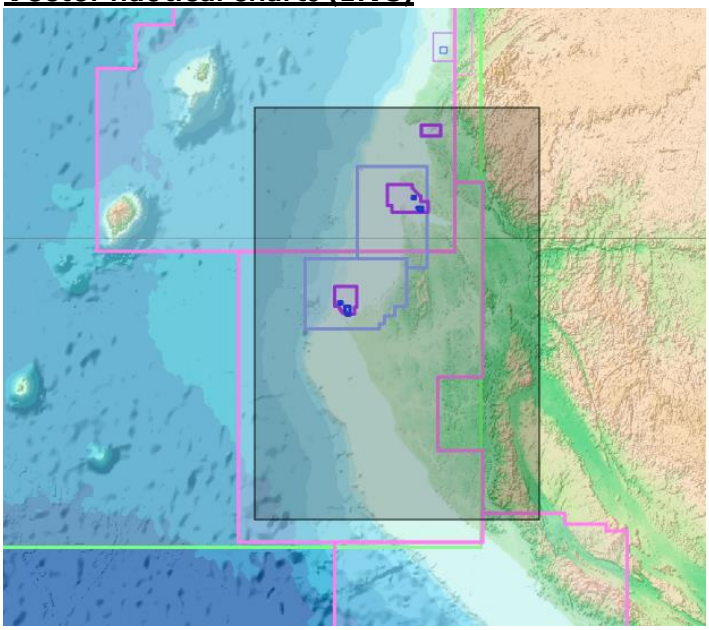




Carte	Titre	Échelle
6808 - INT 21	Océan Atlantique Sud - Partie Est	1 : 10 000 000
6815 - INT 14	Océan Atlantique Nord - Partie Est	1 : 10 000 000
7791 - INT 2089	De Gamba à Luanda	1 : 1 000 000
7188 - INT 2088	De Lagos à Gamba	1 : 1 000 000

7382 - INT 2810	De Calabar à Bata - Isla de Bioko	1 : 350 000
7383 - INT 2811	De Bata à Libreville - Ilhas do Príncipe et de São Tomé	1 : 351 000
7257 - INT 2812	De Libreville à Gamba	1 : 351 251
7588 - INT 2813	De Gamba à Pointe Noire	1 : 350 000
6183	Baie de Corisco - Rivières Mondah et Muny	1 : 103 065
7581 - INT 2920	Du Cap Estérias à la Pointe Ékouata - Approches de l'estuaire du Gabon	1 : 100 000
7583 - INT 2923	De la Pointe Ékouata au Cap Lopez	1 : 100 000
7582 - INT 2922	Estuaire du Gabon	1 : 40 000 / 1 : 15 000
7584 - INT 2924	Abords de Port-Gentil et du Cap Lopez	1 : 40 000 / 1 : 12 000

Vector nautical charts (ENC)



FR271880 - Lagos to Gamba
FR372570 - Libreville to Gamba
FR373830 - Bata to Libreville, Ilhas do Principe and São Tomé
FR375880 - Coasts of Gabon and Congo - Mayumba to Pointe-Noire
FR47841C - ACCESS TO COGO
FR475810 - Cap Esterias to Pointe Ekouata, approaches to estuaire du Gabon
FR475830 - Pointe Ekouata to Cap Lopez
FR57841C - Accès au port de Cogo - Côte de Guinée Equatoriale
FR575820 - Coast of Gabon - Estuaire du Gabon
FR575840 - Approaches to Port-Gentil and Cap Lopez
FR67584B - Cap Lopez
FR67584A - Port-Gentil
FR67582A - Gabon - Estuaire du Gabon - Owendo Harbour
FR67582B - Gabon - Estuaire du Gabon - Libreville harbour

APPENDIX VII TO THE REPPORT N°036/SHOM/DMI/REX/NP DATED 23/04/2025

IHO CONTACTS (P5 YEARBOOK)

Gabon / *Gabon*

Country information / Informations sur le pays / Información sobre el país

National day **-Fête nationale** **-Fiesta nacional**	17 Août

Last updated : February 2025 Dernière mise à jour : Février 2025

OFFICIAL REPRESENTATIVE TO IHO (AS DESIGNATED BY MEMBER GOVERNMENT)

National Centre for Navigational Aids and Waterways Hydrography (CNANHVN)

Contact information / Informations de contact / Información de contacto

- National Hydrographer or equivalent **- Hydrographe national ou équivalent** **- Hidrógrafo Nacional o equivalente**	- Hilarion ONE (Directeur du CNANHVN) - (241) 06 97 24 79 - onhil70@yahoo.fr
- Other point(s) of contact **- Autre(s) point(s) de contact** **- Otros punto(s) de contacto**	- Steve Hervé EYOUNE NZE (Head of the Hydrography Department) - (241) 06 66 77 964 - steveherveyoune@gmail.com
- Other point(s) of contact **- Autre(s) point(s) de contact** **- Otros punto(s) de contacto**	- Mariama OVENG (Geographic engineer) - (241) 06 21 01 51 - mariam_soleil@yahoo.fr

Agency information / Information sur l'agence / Información sobre la agencia

- Top level parent organisation **- Organisme mère** **- Organización asocieda de nivel superior**	Ministry of Transport and the Merchant Navy
- Principal functions of the organisation or the department **- Attributions principales de l'organisme ou du département** **- Principales funciones de la**	According to its founding decree N° 0435/PR/MTMMM from 25/11/2024, CNANHVN's mission is to organise and manage the operation and management of the national system of aids to

Organización o el departamento	maritime navigation and inland waterways and to carry out hydrographic studies and surveys. As such, it is responsible in particular (in collaboration with other organisations) for : - conducting bathymetric and topographic surveys and acquiring oceanographic data ; - centralising, collecting, transmitting and disseminating nautical information; - to produce nautical charts, their updates and other nautical publications (navigational aids, tides, marine currents, etc); - to cooperate with international organisations and bodies in the field of maritime signalling and hydrography; In addition, the CNANHVN will lead the National Committee for Hydrography, Oceanography and Marine Cartography (CNHOCM / Gabon).
- charts / ENC **- cartes / ENC** **- cartas /ENC**	- Currently: produced by Shom (France) - Planned: co-production Shom (France)/ CNANHVN (Gabon)

Other stakeholders : Gabon Port Management (GPM)

- Point(s) of contact **- Point(s) de contact** **- Punto(s) de contacto**	- Bertrand Roger LELE (GPM Technical Director in charge of hydrography) - (241) 06 28 68 913 - blele@gpmgabon.com
- Principal functions of the organisation or the department **- Attributions principales de l'organisme ou du département** **- Principales funciones de la Organización o el departamento**	Port and coastal hydrographic surveys

APPENDIX VIII TO THE REPPORT N°036/SHOM/DMI/REX/NP DATED 23/04/2025

SOURCES – REFERENCES

Object	Visit	Sources	Comments
descriptions and requirements of EAtHC Countries – Gabon			
• As expressed directly by the countries themselves	• - National reports from regional hydrographic commissions (every 2 years)	• https://iho.int/ • https://iho.int/en/rhcs • https://iho.int/en/eastern-atlantic-hc	Last reports (2024) : https://iho.int/en/eathc18-2024 Next reports in 2026
• For the record: Analysis conducted during the EAtHC18 seminar in April 2024: '20 years of capacity building actions within the EAtHC, Review and Prospects'.	• Post meeting document: [Report of the Regional Awareness Seminar: eng ; fra]	• https://iho.int/en/eathc18-2024	Important summary document
Previous IHO Technical Visits– Gabon			
• What the IHO Technical Visits teams have gathered and assessed	• Technical Visit Reports	• https://iho.int/en/capacity-building-and-technical-cooperation • https://iho.int/en/capacity-building-assessment	• 2019 (TECHNICAL VISIT AND VISIT TO TRAINING CENTRES IN GABON 10-13 February 2019) • 2012 (Report on the IHO visit to Gabon in April 2012) • 2002/2003 (Appendix III TO EAtHC WEST AFRICA ACTION TEAM REPORT DECEMBER 2002 COUNTRY REPORT: GABON)

Organisation - International framework Gabon			
• Join IHO	• Registration process Example of Verbal Note (in French)	• https://iho.int/en/become-a-member-state	The annual contribution depends on the tonnage of the national fleet (determining the number of shares). The value of the share is currently (2025) €4,145.05.
• Register with IHO	• IHO P-5 Yearbook	• https://iho.int/en/periodic-publications	Gabon is currently on the list of 'non-member' countries. "For the update, please use the IHO online form available on : https://iho.formstack.com/forms/web_form_p5
• Become an EAtHC Associate Member	• EAtHC bylaws (in basic documents)	• https://iho.int/en/eastern-atlantic-hc • https://iho.int/en/basic-commission-documents-2	Sign the articles of association at a regional committee meeting. Next EAtHC 19 in 2026
Organisation - Bilateral framework - Gabon			
• Cooperating with a third country to carry out hydrographic surveys, produce nautical charts and disseminate information on maritime safety (Bilateral agreements)	• - publication of 'IHO M-2: The need for national hydrographic services (Edition 3.0.7 June 2018)	• https://iho.int/en/miscellaneous-publications	Chapter 5 'National Hydrographic Obligations' - Satisfaction - Bilateral Agreements Administrative Arrangement

Organisation - National Framework			
• Create a National Coordination Committee for Hydrography, Oceanography and Marine Cartography	• publication of IHO M-2	• https://iho.int/en/miscellaneous-publications	Chapter 2 'National Hydrographic Coordination Committee' and 'Stakeholder Ministries'.

LISTE DE DIFFUSION

DESTINATAIRES :

- SECRETARIAT DE L'OHI
- (DIRECTEUR JOHN NYBERG, ASSISTANT DIRECTEUR ERIC LANGLOIS, ASSISTANT DIRECTEUR LEONEL MANTEIGAS, MADAME LORÈNE CHAVAGNAS)
- PRÉSIDENT DE LA CHATO/ EAtHC (MAROC)
- VICE-PRÉSIDENT DE LA CHATO/ EAtHC (ESPAGNE)
- AMBASSADE DE FRANCE AU GABON
- (COLONEL JEAN-CÔME JOURNE)

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- DMI (D-REX-EUR)
- DOPS (PSM - NA)
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