

Direction des missions institutionnelles et des
relations internationales
Division Relations extérieures

Dossier suivi par l'IETA Julien Smeekaert

Tél. +33 (1) 53 66 97 81

Mail: julien.smeekaert@shom.fr

SAINT-MANDE, le 04 mai 2021
N° 012 Shom/DMI/REX/NP

**FRANCE NATIONAL REPORT TO THE 22TH CONFERENCE OF THE MEDITERRANEAN AND BLACK SEAS
HYDROGRAPHIC COMMISSION (MBSHC)**

1. Hydrographic Service: General

Shom is pursuing the achievement of its different commitments based on the National Maritime & Littoral Strategy and the Strategic Review of Defence and National Security according to a 4 years targets and performance contract covering the 2017-2020 period, as approved by Shom's Board. It should be noted that a new targets and performance contract came into force on January 1st 2021 for the 2021-2024 period. Survey works are being conducted according to the prioritized 4-years survey plan for waterways under French jurisdiction.

Detailed information to update IHO Publication P-5 is regularly transmitted to IHO secretariat.

2. Surveys

2.1. Coverage of new surveys

Shom's national hydrographic survey programme (<https://www.shom.fr/fr/qui-sommes-nous/programme-national-dhydrographie-pnh>) details the long-term targeted objectives of CATZOC compliant hydrographic surveying in the Mediterranean Sea and the current surveys coverage for this area.

Since the last Conference, Shom has conducted the following survey works from June 2019 until now:

- Corsica, by BH2 *Lapérouse* (fig. 1);
- Port-Vendres, by BHO *Beautemps-Beaupré* (fig. 2);
- Lebanon, by BHO *Beautemps-Beaupré* (fig. 3);
- Oceanographic campaign in Gibraltar Strait by NO *L'Atalante*;

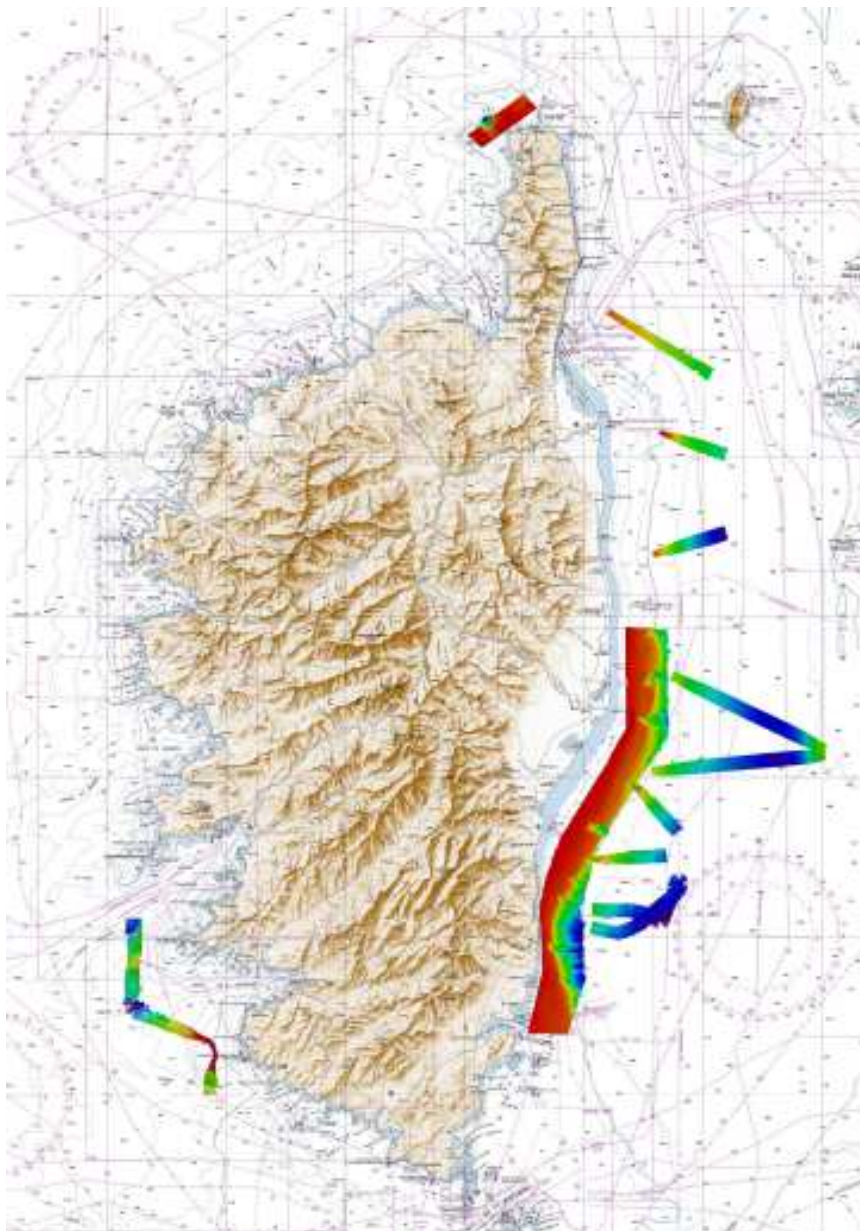


Fig. 1: Survey of Corsica in 2019 by BH2 Lapérouse

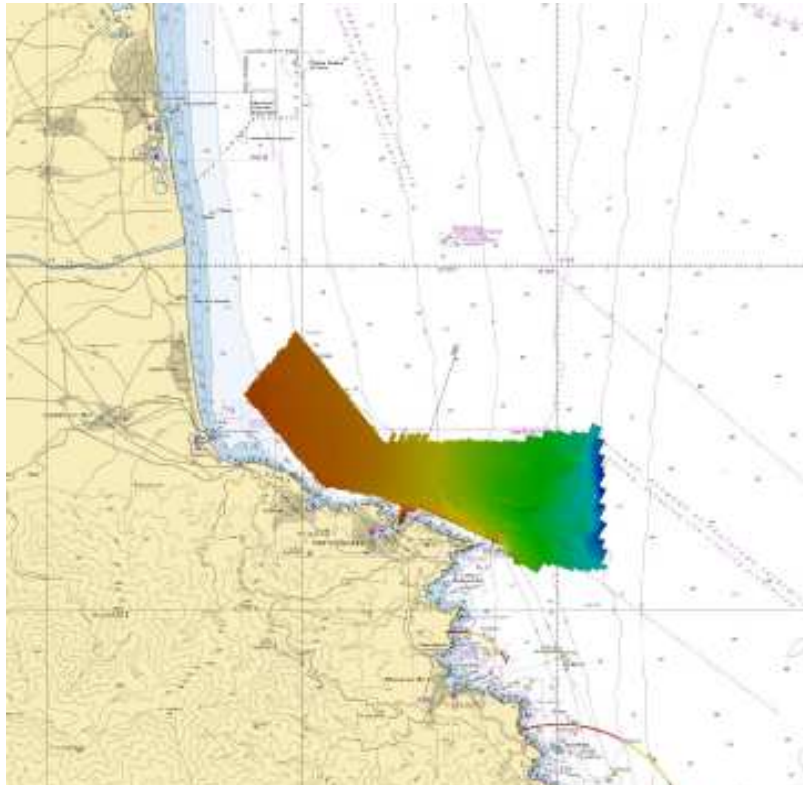


Fig. 2: Survey off Port-Vendres by BHO Beautemps-Beaupré

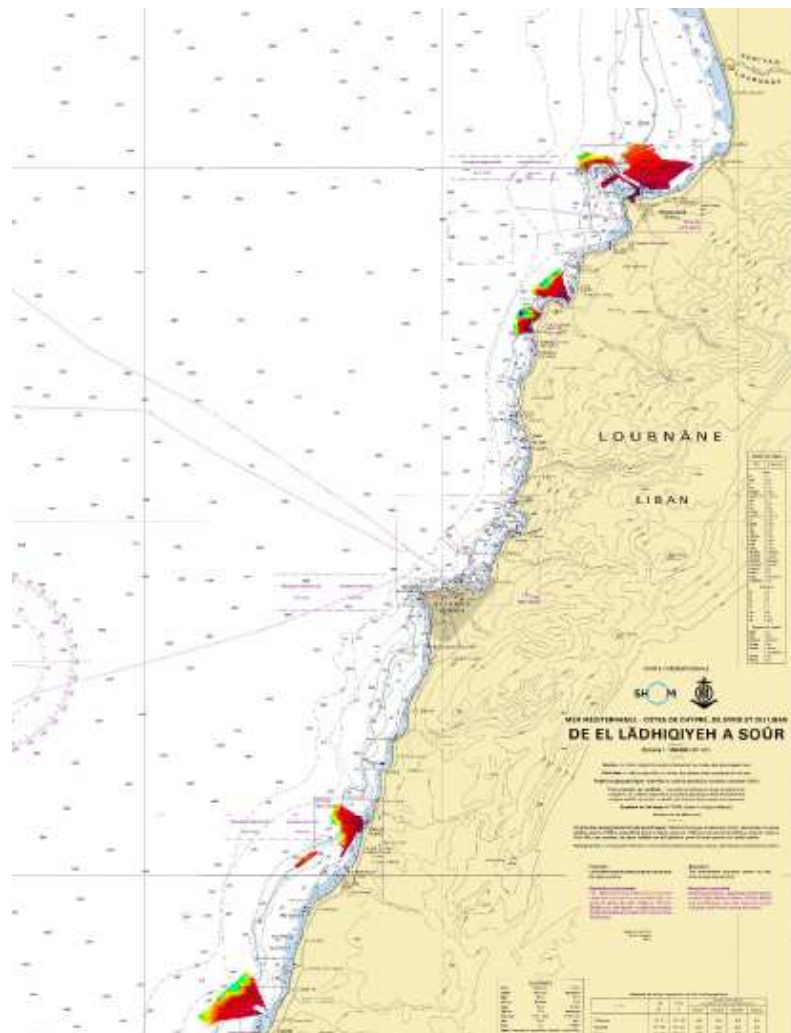


Fig. 3: Survey in Lebanese waters by BHO Beautemps-Beaupré

2.2. LIDAR Surveys

LIDAR surveys are conducted within the framework of Litto3D[®] programme. This national programme, based on a partnership between Shom and the National Institute of Geographic and Forest Information (IGN), aims to provide a very high-resolution Sea-Land digital terrain model (DTM) of metropolitan and overseas French coasts.

A topographic-bathymetric lidar survey covering the Corsica region has been completed in 2018 (cf. Fig.7). Data already processed is freely accessible on Shom's data portals (see Fig. 5), and the rest will be released in the second half of 2021.

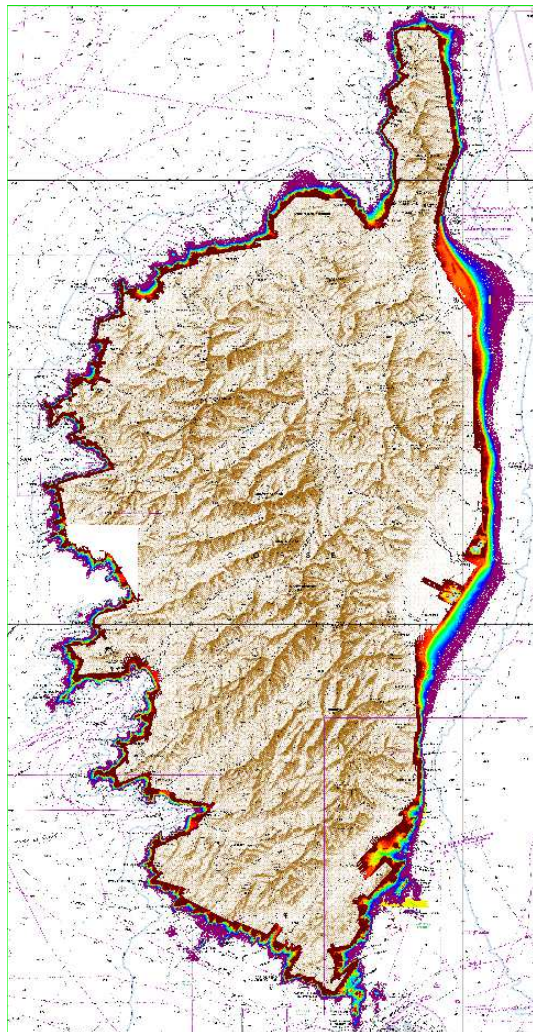


Fig. 4: Lidar Survey of Corsica - 2018

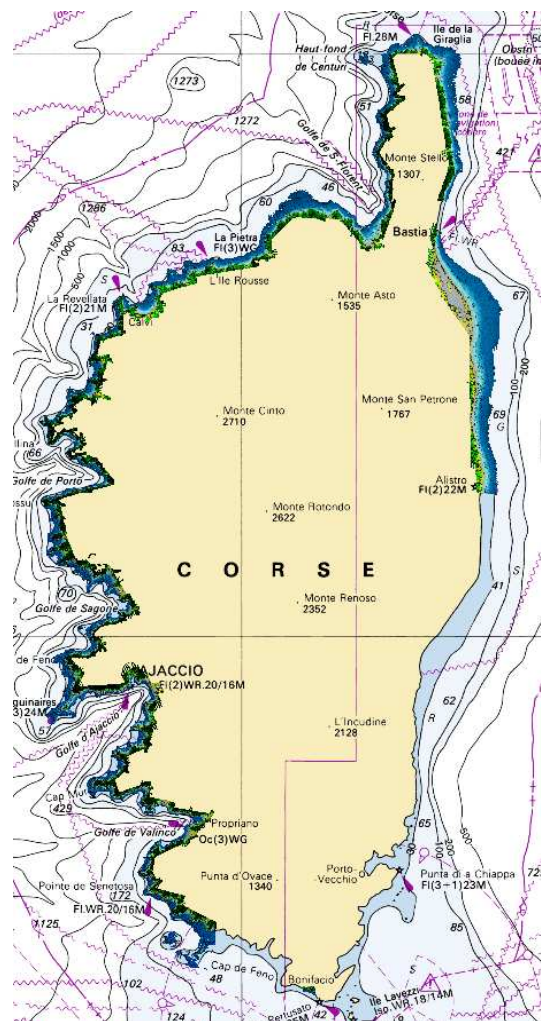


Fig. 5: Lidar Survey of Corsica - 2018 / Data available on Shom's portals

All Litto3D[®] products are freely available through Shom's data portals:

- data.shom.fr (Shom catalog / Master data / Coastal altimetry): data.shom.fr
- diffusion.shom.fr: <http://diffusion.shom.fr/pro/risques/altimetrie-littorale.html>

and the French Government open platform for public data: data.gouv.fr.

2.3. Shom's survey programme for the region

Survey campaigns are planned by Shom on a regular basis in French waters and areas under French responsibilities to update nautical charts.

The survey programme for the Mediterranean area for 2021-2022 focuses on:

- hydrographic surveys in French waters (Golfe du Lion) in 2022;
- oceanographic campaign in Gibraltar Strait in 2022.

2.4. New technologies and / or equipment

Shom's deployable system for hydrography (for REA surveys) has been upgraded with very shallow water multibeam echosounder (Norbit iWBMSH).

See §10.1 for the preparation of future capacities.

2.5. New ships

NTR.

2.6. Crowdsourced and satellite-derived bathymetry - national policy

Crowdsourced bathymetry

Shom translated the IHO B-12 Edition 2.0.3 (Guidance on Crowdsourced Bathymetry) into French.

France's CSB policy is currently under review.

Satellite-derived bathymetry

The satellite-derived bathymetry (SDB) has already been used for many years by Shom to complement traditional surveys (acoustic sounding surveys) to produce nautical charts in the Pacific region

(available online

https://services.data.shom.fr/geonetwork/srv/eng/catalog.search#/metadata/TRAITEMENT_IMAGE_SPATIO_CARTE_MARINE.xml).

As an operator of a SDB production line, Shom is currently conducting a research and development project in the field of SDB: Bathysat project.

The objective of the project is to improve performance and quantify vertical uncertainties in accordance with the specifications of the new version of the S-44 (Edition 6.0.0). The results of the study should make it possible to extend the use of the SDB to areas where no field data are available.

The research part of the project has been completed last year. Results performed on different geographic areas (including an area in Pacific Ocean) have enabled to evaluate the capacity of the methods on the following objectives:

- the non-use of bathymetric measurements (to process pure remote SDB analysis);
- the accuracy of the solution faced with the seafloor complexity (reliability and limit of the parameterization of seafloor reflectance inside the model);
- the automatization and improvement of the calculation processes.

The development part will start this year with the candidate selected from the analysis of the results of the research phase. The objective of this next step is to develop a prototype of the future production line complying with the following concepts of operation:

- to develop, on a case-by-case basis, charting products in remote areas (in the absence of conventional hydrographic surveys),
- to generate seabed morphology products (DTMs) useful for hydrodynamic modelling in particular,
- to have a tool for rapid coastal environment reconnaissance: estimation of bathymetric characteristics, turbidity, coastline,
- to detect, on a case-by-case basis, possible morphological changes in the seabed in the coastal strip (high revisit rates) in order to prioritize hydrographic surveys (decision support tool).

2.7. Challenges and achievements

Following the explosion in the port of Beirut on 4 August 2020, France immediately launched assistance operation *Amitié* and deployed LHD *Tonnerre* during the month of August with a Shom's team equipped with the deployable system for hydrography on board. This team carried out a joint survey in the port with LNHS in order to provide a quick cartography with temporary charts and to locate obstructions, allowing safe access to the quays. This strong interaction also took place with the Royal Navy, whose HMS Enterprise conducted an external survey of the approaches to Beirut harbour. The results of the joint LNHS – Shom surveys are available at: <https://diffusion.shom.fr/pro/assistance-liban>.

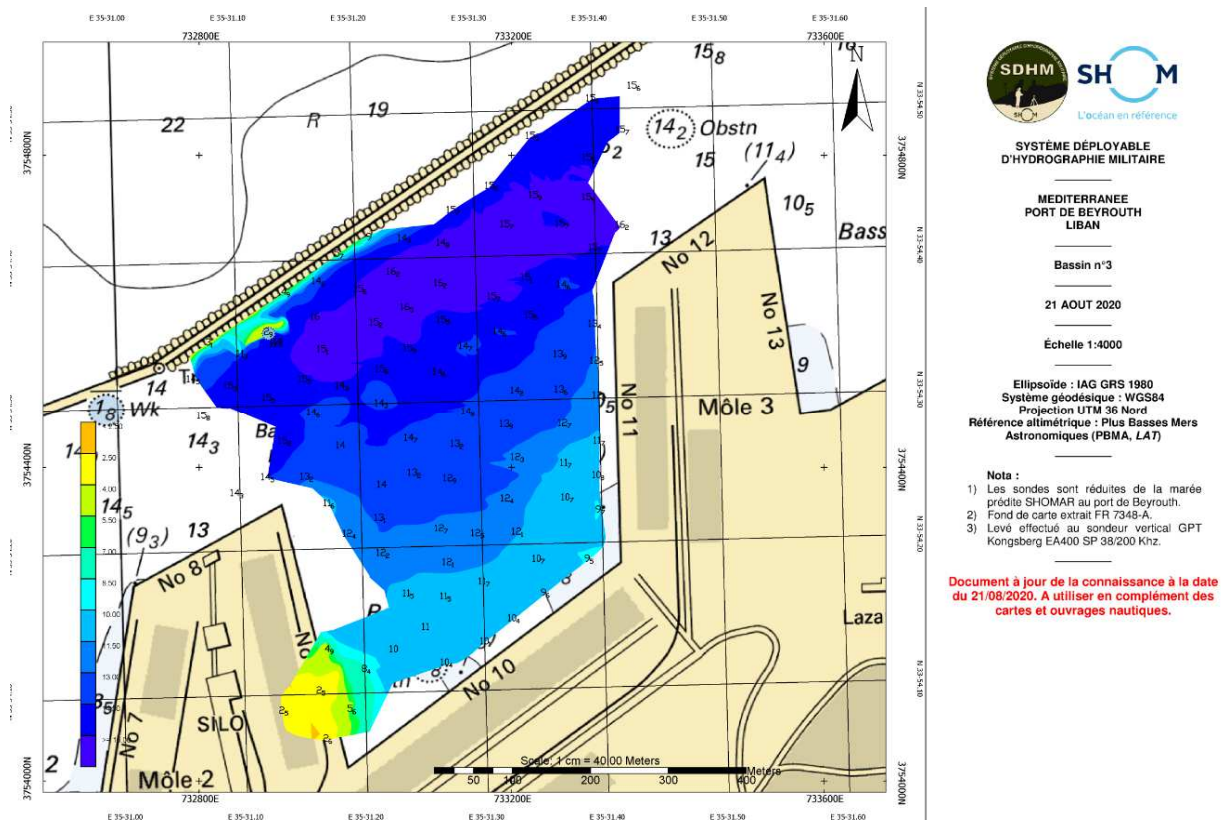


Fig. 6: Survey jointly conducted by LNHS and Shom in Basin No 3 of Beirut Port

These surveys were used to update nautical charts (INT and ENC) and the Port Approach Guide of Beirut.

3. New charts & updates

3.1. ENCs

As of 1st March 2021, Shom has produced 777 ENCs, of which 115 ENCs within region F.

The full collection should eventually reach around 900 ENCs.

In line with the WEND recommendations and guidelines, France produces its small scale ENC cells as closely as possible to INT chart schemes.

Shom plans to produce 2 new cells in 2021 in order to increase the UB3 and UB4 coverage in the Western Part of Region F. Details are provided in the table below:

| Usage Band | Produced Cells | Planned Cells | Percentage |
|------------|----------------|---------------|------------|
| 1 | 0 | 0 | / |
| 2 | 1 | 1 | 100 |
| 3 | 4 | 5 | 80 |
| 4 | 24 | 25 | 96 |

| | | | |
|--------------|-----|-----|-----|
| 5 | 48 | 86 | 100 |
| 6 | 38 | | |
| Total | 115 | 117 | 98 |

The following figures are extracts from the online PRIMAR catalogue <http://www.primar.org> showing Shom ENC coverage within the MBSHC (region F) area:

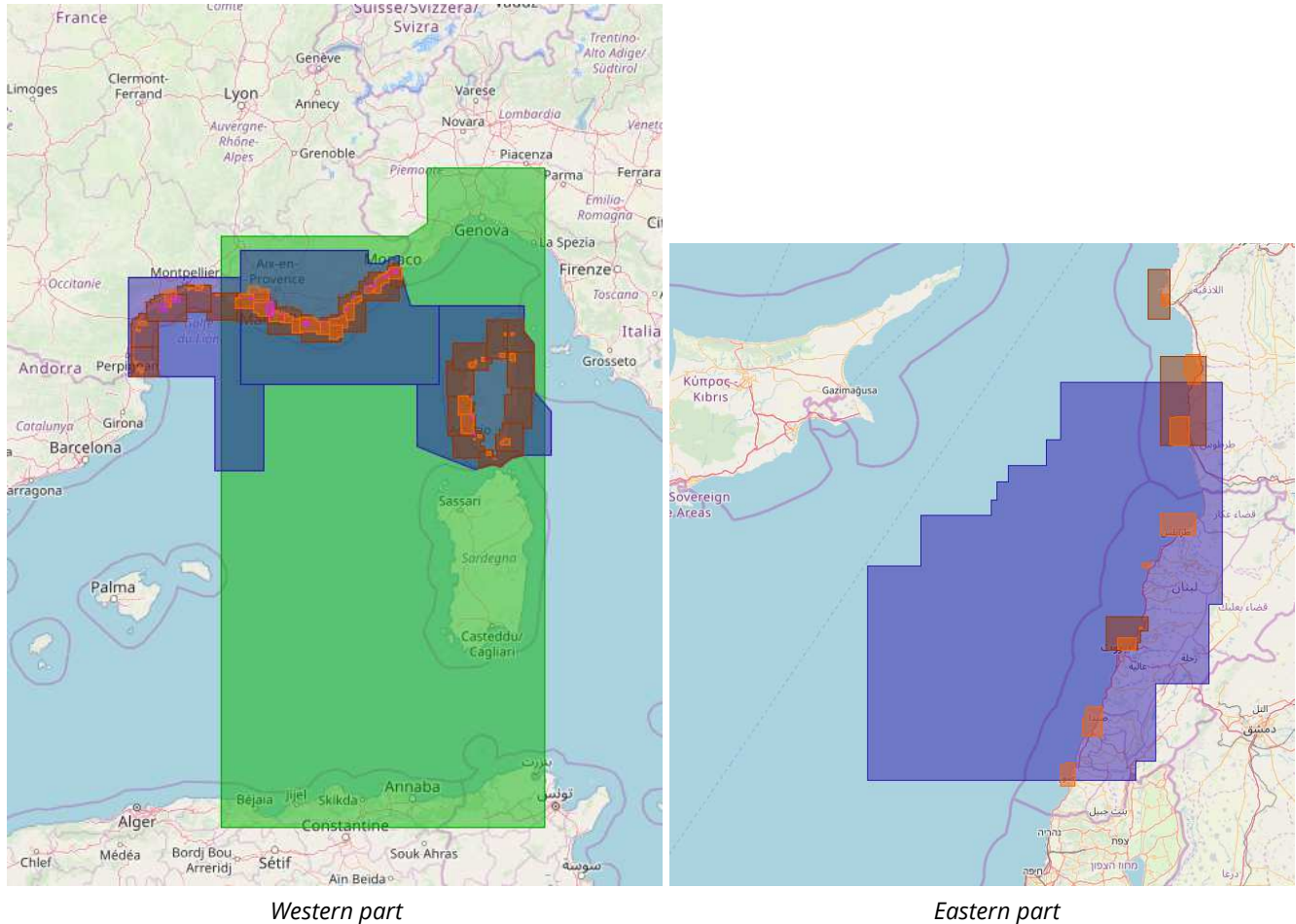


Fig. 7: Shom ENC coverage within Region F

3.2. ENC Distribution method

All French ENCs (S-63 encrypted format) are distributed to End User Service Providers by PRIMAR RENC. France is providing its support to the work plan of the WEND working group for improving the implementation of WEND principles.

3.3. RNCs

NTR.

3.4. INT charts

The overall INT chart production status for the region F is provided below:

| Scale | Produced INT charts | Planned INT charts | Percentage |
|--------------------------------|---------------------|--------------------|------------|
| Small (<1/1 000 000) | 1 | 1 | 100 |

| | | | |
|------------------------------|----|----|-----|
| Medium | 5 | 5 | 100 |
| Large (>1/100 000) | 17 | 17 | 100 |
| Total | 23 | 23 | 100 |

See next section (3.5) for details (charts produced and production plan for the period 2021-2022).

3.5. National paper charts

Since the last MBSHC conference, the following charts have been produced or edited:

| National | INT | New chart (NC) or new edition (NE): | Scale 1: | Title |
|---------------------------|------------|--|-----------------|---|
| 4314 | / | NE | 328 000 | D'Annaba (Bône) à Tunis |
| 4315 | / | NE | 335 000 | De Tunis à Sfax |
| 5669 | / | NE | 10 000 | Port d'Annaba (Bône) |
| 6823 | / | NE | 50 600 | Abords Sud de Bastia |
| 6850 | / | NE | div | Saint-Florent, Centuri et Macinaggio |
| 7003 | / | NE | div | Le Cap d'Agde, Saint-Cyprien, Banyuls-sur-Mer et Gruissan |
| 7348 | 3670 | NE | div | Approches de Beyrouth |
| 7392 | 3195 | NE | 25 000 | Du Cap Couronne au Cap Croisette - Golfe de Marseille |
| 7436 | 3345 | NE | div | Approches et Port de Bastia - Ports d'Ajaccio et de Propriano |
| 7513 | 3669 | NE | div | Ports de Syrie |
| <i>Fac simile charts:</i> | | | | |
| 6775 | / | NE | 10 000 | Puerto de Palma de Mallorca (fs IT4211) |
| 6804 | / | NE | 30 000 | Abords de Cagliari (fs IT299) |
| 7036 | / | NE | 20 000 | Porto di Taranto (fs IT148) |
| 7189 | / | NE | 25 000 | Golfes d'Olbia et d'Aranci (fs IT322) |
| 7226 | / | NE | 10 000 | Venezia - Porto Marghera (fs IT225) |
| 7228 | 3464 | NE | 50 000 | Abords de Venezia (fs IT222) |
| 7276 | 3172 | NE | 25 000 | Abords de Valencia (fs IT481A) |
| 7333 | 3500 | NE | 300 000 | De Al Burullus à Al 'Arīsh (fs GB2573) |
| 7500 | 3386 | NE | 10 0000 | Port de Napoli (fs IT84) |
| 7516 | / | NE | div | Abords et port de Livorno (fs IT62 et IT120) |
| 7529 | / | NE | div | Abords et Port d'Ancona (fs IT209) |
| 7665 | / | NE | 50 000 | Du Cap Negre au Cap Cerbère (fs ES493) |
| 7674 | / | NE | 7 500 | Ports de Valletta (GB177) |
| 7773 | / | NE | 25 000 | Îles de Capraia et Gorgona (fs IT116) |

The following charts are planned to be published in 2021-2022:

| National | INT | New chart (NC) or new edition (NE): | Scale 1: | Title |
|----------|------|-------------------------------------|----------|----------------------------------|
| 3036 | / | NE | 102 000 | De Dellys au Cap Sigli |
| 3043 | / | NE | 100 000 | D'Alger à Dellys |
| 6713 | / | NE | 152 000 | Côte Nord-Est de la Corse |
| 6822 | / | NE | 50 300 | Abords Nord de Bastia |
| 6843 | 3186 | NE | 50 500 | Du Cabo Creus à Port-Barcarès |
| 7162 | / | NE | 51 300 | Du Cap Muro au Cap de Feno |
| 7205 | / | NE | 15 000 | Golfe de La Napoule - Golfe Juan |
| 7255 | 3606 | NE | 250 000 | De El Lādhiqiyeh à Soûr |
| 7280 | / | NE | 25 000 | Golfe d'Ajaccio |
| 7348 | 3670 | NE | 30 000 | Approches de Beyrouth |
| 7441 | 3190 | NE | 7 500 | Abords et Ports de Monaco |
| 7514 | 3671 | NE | div | Ports du Liban |

3.6. Other charts, e.g. for pleasure craft

Shom provides georeferenced marine charts in GeoTiff and S-57 format when produced. These digital marine charts are now available through Shom online store <http://diffusion.shom.fr> under various licenses¹ according to the purpose of use. These data can be used with GIS or cartographic software for commercial or private purposes.

A S-57 license² allows download of updated versions for 12 months from the date of purchase.

3.7. Challenges and achievements

Between September and December 2021, Shom will review its facsimile portfolio (from 253 fs to 66 fs – mainly charts covering French waters).

In 2020, Shom, in support of Lebanon, updated its INT charts after the blast in Beirut (temporary notices, blocks, etc.).

4. New publications & updates

4.1. New Publications

NTR.

4.2. Updated publications

Publications are updated weekly in accordance with Shom Notices to Mariners.

New editions of the following sailing instructions have been published since the last MBSHC meeting:

¹ Internal reuse, commercial reuse, documentary use or end user.

² Each license allows internal reuse of the data for up to 5 workstations. For more information, contact bps@shom.fr.

- D23 : France – Côtes de Corse (July 2020);
- D31 : Italie (côte Ouest – partie Nord) – Sardaigne (October 2020);
- D32 : Italie (côte Ouest – partie Sud) – Îles Maltaises et Sicile (October 2020).

4.3. Means of delivery

All nautical publications are available in digital format only (pdf files) on Shom online shop (<http://diffusion.shom.fr>).

4.4. Challenges and achievements

NTR.

5. MSI

5.1. Existing infrastructure for transmission

Shom's notices to mariners (GAN) are exclusively available under digital formats on Shom website: <http://diffusion.shom.fr/gan>.

5.2. Statistics on work of the National Coordinator

See Appendix.

5.3. New infrastructure in accordance with GMDSS Master Plan

NTR

5.4. Challenges and achievements

MRCC NAVTEX station is inoperative since January 2020. See details in Appendix.

6. C-55 Latest update

The latest C-55 update for both Survey and Charting Status in the Mediterranean region was realised via the online form on April 15th 2021.

C-55 charting and surveying status updated values regarding Region F areas under Shom responsibility are summed up in the following tables:

| Survey Status Updated March 2021 | | Depth < 200m | | | Depth > 200m | | | | | | | |
|---------------------------------------|-------------------------|--------------|------|------|---------------------------|-----|-----|-------------------|---|-----|--------|-------|
| | | A | B | C | A | B | C | | | | | |
| F | France Méditerranée | 27.2 | 71.3 | 1.5 | 90.4 | 0.0 | 9.6 | | | | | |
| | Liban | 23.1 | 17.8 | 59.1 | 94.2 | 0.0 | 5.8 | | | | | |
| | Monaco (Principauté de) | 79.5 | 19.0 | 1.5 | 95.4 | 0.0 | 4.6 | | | | | |
| Charting Status Updated April 2021 | | Small (<1 M) | | | Medium (1M < / < 100 000) | | | Large (> 100 000) | | | Metric | WGS84 |
| | | A | B | C | A | B | C | A | B | C | | |
| F | France Méditerranée | 100 | / | 100 | 100 | / | 100 | 100 | / | 100 | 100 | 100 |
| | Liban | 100 | / | NA | 100 | / | 100 | 100 | / | 100 | 100 | 75 |
| | Monaco (Principauté de) | 100 | / | 100 | 100 | / | 100 | 100 | / | 100 | 100 | 100 |

C-55 values for survey status (top table) and charting status (down table). Updated values are highlighted in red.

7. Capacity Building Offer of and/or demand for Capacity Building

7.1. Training received, needed, offered

Initial training capabilities provided by Shom include the following FIG-OHI-ACI courses: category B for hydrographic surveyors and category B for nautical cartographers. So far, these courses³ are provided in French and are open to francophone foreign applicants.

A category A course for hydrographic surveyors is provided at ENSTA Bretagne.

SHOM L'océan en référence

TRAINING COURSES PROVIDED BY SHOM SCHOOL

| Course | Average number of students | Duration | Admission | Curriculum |
|---|--|-----------|---------------------------------------|---|
| BS/L3* HYDRO* | 2 to 8 petty officers/ 2 foreign students/ 10 students UBO | 14 months | based on application file | manoeuver and navigation Training specific course on hydrography and oceanography on board end-study project |
| C SYSRES-HOM | 2 to 5 hydrographers petty officers | 9 months | based on application file | Information technology theoretical and practical training (application to hydrography IT) Practical internships in SHOM IT department and survey unit (GHOA) |
| C SUP HYDRO*** | 2 to 5 hydrographers petty officers | 4 months | based on application file | advanced technical training on hydrography team management training |
| NAUTICAL CARTOGRAPHER TRAINING COURSE* | 2 to 8 trainees | 9 months | based on diplomas or competitive exam | general training on hydrography and geosciences specific training on nautical cartography end-study technical project |

SHOM school support to L'ENSTA Bretagne HYDROGRAPHIC ENGINEER**

| | |
|----------------------------|---|
| Average number of students | 36 months (+12 months for French military students) |
| Duration | based on diplomas or competitive exam |
| Admission | see: www.ensta-bretagne.fr |
| Curriculum | |

Accreditation logos: Cti, FIG, ICA, CAP, EUR-ACE.

www.shom.fr

Fig. 8: Courses and training provided at the Shom hydrographic school (source: shom.fr)

Hereafter are listed the training courses provided or being providing since September 2020 to foreign trainees from the MBSHC region since the MBSHC20 conference:

| Country | Course | Year | Student |
|----------------|------------------------------|-----------|---------|
| Morocco | Cat B. Hydrographic course | 2019-2020 | 1 |
| Morocco | Cat B. Nautical cartographer | 2020-2021 | 1 |
| Lebanon | Cat B. Nautical cartographer | 2020-2021 | 1 |

7.2. Assistance for the construction of hydro-oceanographic vessels

Shom has a recognized know-how in the field of hydro-oceanographic vessel construction (from the 8m launch to the 100m ship), has the mastery of the whole process from the expression of needs to the implementation of systems. He puts his expertise at the service of shipyards, within the framework of new construction or modernization for:

- Studies, in order to define, on the basis of an expression of need, the complete specifications in terms of hydro-oceanographic equipment (including IT), as well as the layout of the premises and

³ Training offer: <http://www.shom.fr/le-shom/formation-emplois-stages/formation/>
Modalities: drh-for-eco@shom.fr

scientific areas of a hydro-oceanographic vessel. Shom provides intellectual services such as the drafting of the metrology survey essential for the proper integration and control of systems, the specification of spare parts batches adapted to the ship's missions, the interface drawings, the recipe book and the ship's logbook (in its field of expertise).

- Reception and integration of equipment: supervision of the integration (mechanical, interfacing, metrology...) of equipment, factory, harbour and sea acceptance tests.
- Training and assistance: training of the personnel having to implement the equipment, but also of the personnel ensuring the maintenance of the systems, transfer of skills, handling of warranty calls after delivery of the vessel to the final customer.



Fig. 9: Nigerian hydrographic vessel Lana built by the French shipyard OCEA with Shom support (Source: OCEA)

7.3. Status of national, bilateral, multilateral or regional development projects with hydrographic component

For the countries benefiting from Shom support to meet their hydrographic services obligations spelled out by the SOLAS convention, France fosters a mechanism of gradual transfer of responsibilities through State-to-State administrative arrangements. This mechanism relies on training at Shom facilities and the formalisation of the respective responsibilities for maritime safety information, hydrographic and charting activities.

7.4. Definition of proposals and requests to the IHO CBSC

NTR.

8. Oceanographic activities

8.1. GEBCO/IBC's activities

On waters under French jurisdiction in the SAIHC region, Shom's bathymetric data are accessible:

- in the form of regional or coastal bathymetric DTMs:
<http://diffusion.shom.fr/pro/risques/bathymetrie.html?p=1>

- in the form of bathymetric datasets (soundings):
<http://diffusion.shom.fr/pro/amenagement/bathymetrie/lots-bathy.html>; <https://www.emodnet-bathymetry.eu/search>

Data relative to transits in French waters and overseas waters have been provided to IHO DCDB and for integration into the GEBCO grid in 2018.

Note that the distribution of coverage survey polygons along with associated metadata on the IHO DCDB website, is ensured for Shom, through the EMODnet Bathymetry portal supported by the European Union. An update of all these bathymetric resources has been provided in December 2020.

8.2. Tide gauge network

Shom is the national coordinator and reference authority for the observation of the sea level, collecting, managing and distributing the data, including those produced by Shom tidal network, RONIM.

These missions are carried out under the REFMAR programme. All real time and processed tide gauge measurements collected under that programme are freely accessible on the web <http://data.shom.fr/#donnees/refmar> for all areas under French jurisdiction.

This network is recognized as an important tool for coastal operational oceanography, risk assessment, studies on the evolution of the mean sea level, etc.

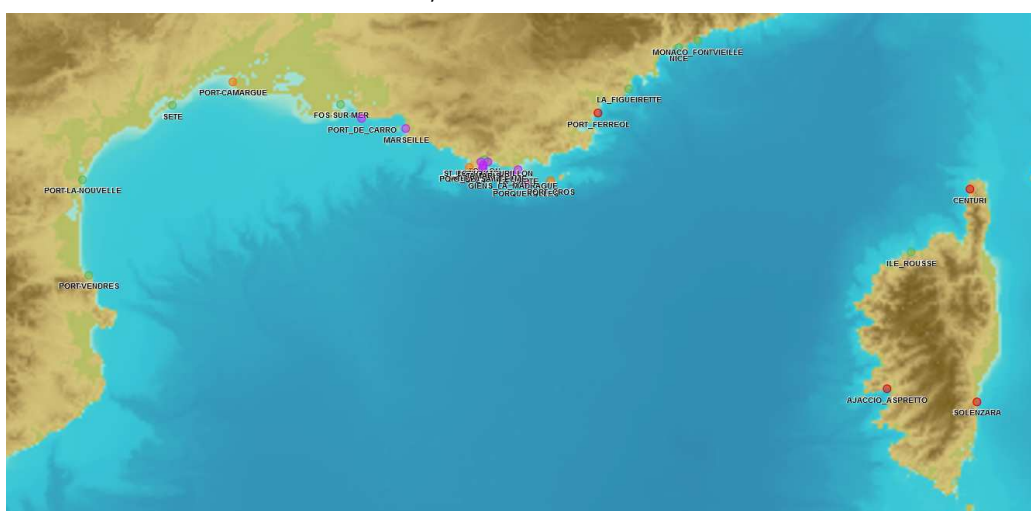


Fig. 10: Real time measurements from REFMAR tidal network on Shom's web portal (data.shom.fr)

Since 2018, Shom is collecting and distributing data provided by the HTMNET Network. This network is operated by the Mediterranean Institute of Oceanography (MIO) under the Ministry of Research. 11 new stations were added to the REFMAR coordination. Shom is working to improve qualification of these stations by carrying field levelling campaigns.

Shom's tidal predictions are available through a web/smartphone/tablet-friendly online service named maree.shom.fr. This service provides free access of one year of tidal predictions from over 1,000 harbours worldwide.

8.3. New equipment

NTR.

8.4. Challenges and achievements

Marseille tide-gauge has lost real-time transmission capability since the end of 2018. Correction is underway.

9. Spatial data infrastructures

9.1. Status of MSDI

Shom develops and maintains a MSDI covering all maritime areas under French jurisdiction. The information thus compiled is accessible through 3 portals:

- data.shom.fr
- diffusion.shom.fr
- maritimelimits.gouv.fr

9.2. Relationship with the NSDI

The various maritime geographical information produced by Shom are referenced on the French NSDI (<https://www.data.gouv.fr/>).

9.3. Involvement in regional or global MSDI efforts

In the framework of a European project supporting the implementation of the maritime spatial planning EU Directive in the Mediterranean area, MSP MED (2020-2022):

- Shom participates to the establishment of an inventory of data and tools or MSDIs used by the EU Member States to establish and/or disseminate the MSP plans.
- It develops the production and dissemination of relevant datasets related to its missions, for MSP, in particular in a transboundary context (wrecks and obstructions, separation traffic schemes, Litto3D, cables and pipelines...).
- It also participates to the preparation and enhancement of the dissemination workflow (Geolittoral, French National Portal of Maritime Limits, EMODnet Human Activities portal...) of the MSP official French plans zones, by carrying out an assessment of the zone limits.

Regarding maritime surveillance, Shom participates to MED OSMoSIS project (2019-2022) dedicated to foster data exchanges mechanisms and interoperability between MSs for European coastguards' activities:

- As part of the French initiatives to develop the Common Information System Environment for maritime surveillance in Europe, Shom is undertaking a technical test to integrate some of its datasets (marine nautical charts, maritime delimitations, search and rescue zones...).
- It also develops a web application tool for issuing Navigational Warning edition, S-124 compliant. This tool will be tested by some European partners. It is a component of the under-development national platform for the French nautical information (PING project).
- It develops tools to enhance the interoperability of data.shom.fr (English translation, capacity to set up thematic geoportals and to integrate them in external web pages...).

9.4. National implementation of the Shared Data Principles – including any national data policy and impact on marine data

In accordance with France open data policy, Shom has widely opened up access to its core data: bathymetric data, wrecks, cables, bottom types, maritime limits, and toponyms databases for example are distributed under Creative Commons « CC-BY-SA 4.0 » licence.

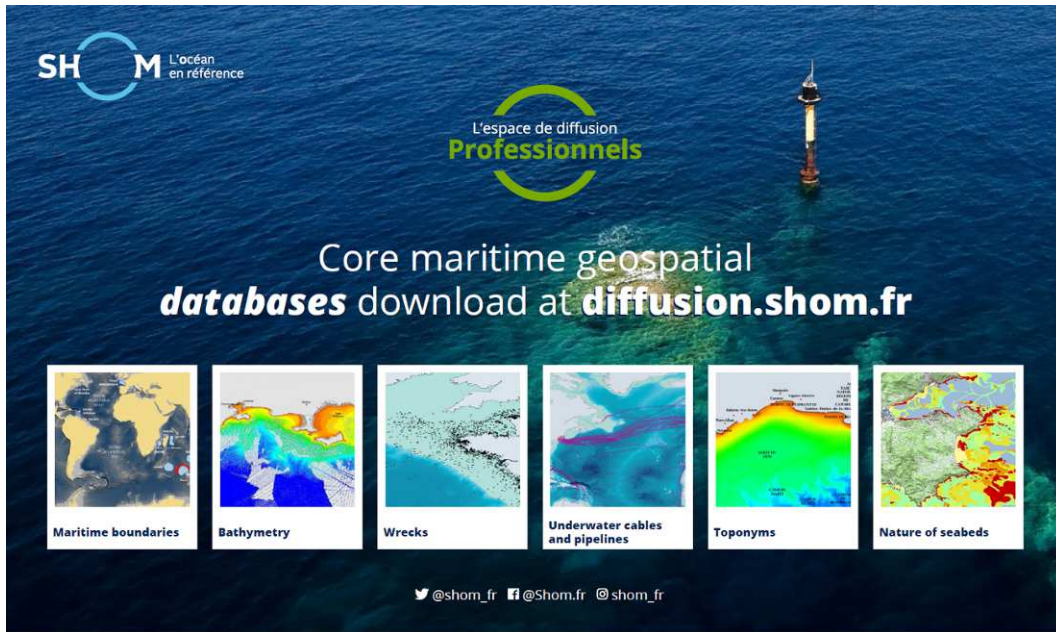


Fig. 11: open data (diffusion.shom.fr)

9.5. MSDI national portal

Since the launch of Shom's maritime and coastal geographic information portal data.shom.fr, further developments have been implemented with new online services data layers on a regular basis.

Data available on that portal are organised according to the following topics:

- Master data: charts, maritime boundaries, maritime and coastal databases, coastal altimetry, bathymetry, vertical datums, sedimentology, tides and currents and marine archives;
- Oceanographic forecast: sea state, meteorology, sea level, hydrodynamic;
- Coastal observations: HF radar and tide gauge data.

Not all this information may be available on MBSHC region.

Hereafter are listed some of the latest evolutions:

- Limits related to fishery uses (3 and 6 NM) (new layer)
- Limit of the preventive archaeology licence fee (1 NM) (new layer)
- Traffic separation scheme layer (new layer)
- Litto3D® marine part - Corsica 2017-2018 (data coverage extended)
- Maritime Altimetric References (new edition)
- New edition of high-resolution coastline (Aude and Var departments)
- Annual edition of wrecks and obstructions layer, tides predictions...
- New tools and services (<https://services.data.shom.fr/support/fr>)

Those evolutions can all be followed via Shom's Twitter account (@shom_en & @shom_fr).

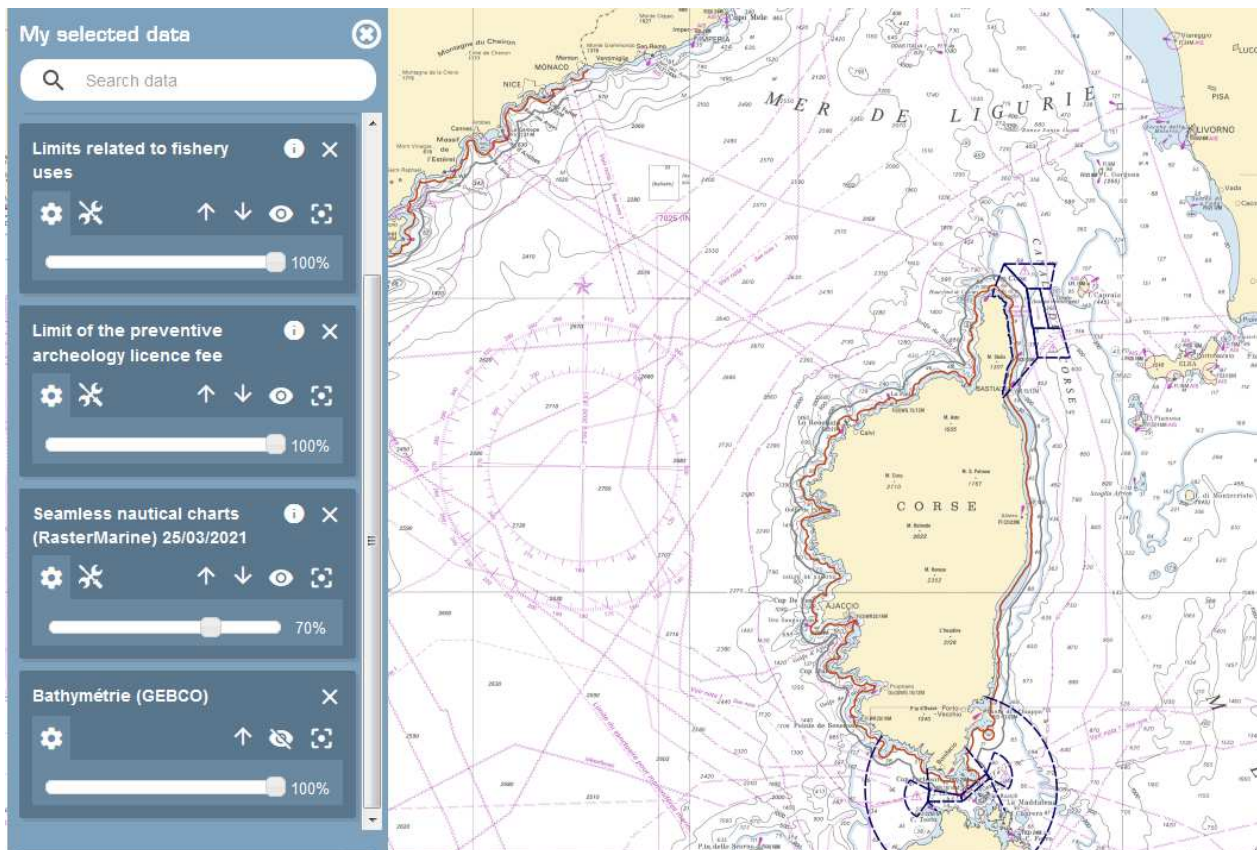


Fig. 12: Traffic separation scheme, 1, 3 and 6 NM limits (data.shom.fr)

9.6. Best practices and lessons learned

NTR.

9.7. Challenges and achievements

NTR.

10. Innovation

10.1. Use of new technologies

As part of the preparation phase for the replacement of the hydro-oceanographic fleet (CHOF project), an agreement was signed with the procurement agency of the French DoD (DGA) for a period of three years in order to conduct experiments and modernise hydrographic data processing techniques.

A first experiment was carried out in September 2020 with 2 USV DriX from iXblue; another experiment was carried out in January 2021 with AUV Gavia from Teledyne; deep-sea and shallow water AUV, USV and gliders experiments are also planned in the coming months. Beyond the evaluation of the hydrographic performance of these new platforms, these experiments should make it possible to adapt the organisation and processes in order to get the best out of these new technologies.

10.2. Risk assessment

Shom has finished in 2020 the development of a prototype tool called "Deseason platform". It is a multicriteria decision tool, for hydrographic risk assessment and cost-benefit analysis. It will be used in the coming years in order to improve the national hydrographic survey programme.

10.3. Policy matters

NTR.

11. Other activities

11.1. Participation in IHO meetings

Because of its overseas territories and primary charting responsibilities, France, represented by Shom, is a member or associate member in 9 regional hydrographic commissions.

The detail of Shom's involvement in other IHO activities is listed in the table hereafter:

| Name | Chair / Vice chair | Member | Observations |
|--------|--------------------|--------|---|
| CBSC | | ✓ | Capacity Building Sub-Committee |
| NCWG | | ✓ | Nautical Cartography Working Group |
| ENCWG | | ✓ | ENC Standards Maintenance Working Group |
| DPSWG | | ✓ | Data Protection Scheme Working Group |
| DQWG | | ✓ | Data Quality Working Group -Last meeting in 1996 |
| EAtHC | ✓ | ✓ | Eastern Atlantic Hydrographic Commission |
| FC | | ✓ | Vice-chairman of Finance Committee |
| GEBCO | | ✓ | Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of Oceans (GEBCO) |
| HCA | | ✓ | Hydrographic Commission on Antarctica |
| HDWG | ✓ | ✓ | Hydrographic Dictionary Working Group |
| HSSC | ✓ | ✓ | Hydrographic Services and Standards Committee |
| IENWG | ✓ | ✓ | IHO-European Union Working group |
| IRCC | | ✓ | Inter-Regional Coordination Committee |
| MACHC | | ✓ | MESO American & Caribbean Sea Hydrographic Commission |
| MBSHC | | ✓ | Mediterranean and Black Seas Hydrographic Commission |
| MSDIWG | | ✓ | Marine Spatial Data Infrastructure Working Group |
| NIOHC | | ✓ | North Indian Ocean Hydrographic Commission |
| NIPWG | | ✓ | Nautical Information Provision Working Group |
| NSHC | | ✓ | North Sea Hydrographic Commission |
| RSAHC | | ✓ | ROPME Hydrographic Commission |
| S100WG | | ✓ | S-100 Working Group |
| SAIHC | | ✓ | Southern Africa and Islands Hydrographic Commission |
| HSWG | | ✓ | Hydrographic Surveys Working Group |
| SWPHC | | ✓ | South-West Pacific Hydrographic Commission |
| TWCWG | ✓ | ✓ | Tidal, Water Level and Currents Working Group |

| | | | |
|-------|--|---|---|
| WEND | | ✓ | World-Wide Electronic Navigational Chart Database |
| WWNWS | | ✓ | World-wide Navigational Warning Service Sub-Committee |

11.2. Meteorological data collection

NTR.

11.3. Geospatial studies

NTR.

11.4. Preparation for responses to disasters

France may have Navy ships in the MBSHC region ready to provide support in case of an emergency. France also provides technical support and has a rapid response capacity for environmental data in case of a disaster.

The point of contact at Shom in case of a marine disaster is the head of the maritime safety information division. This division can be reached 24/7 by fax +33 298 221 665 or email coord.navarea2@shom.fr.

- **Tsunami :**

SHOM is maintaining a large real time tide gauge network RONIM, an important tool for coastal operational oceanography, risk assessment, studies on the evolution of the mean sea level, etc. Having tide gauges in Europe and in the French overseas territories, SHOM is contributing to Tsunami warning in Pacific Ocean, Indian Ocean, Caribbean Sea and Mediterranean Sea.

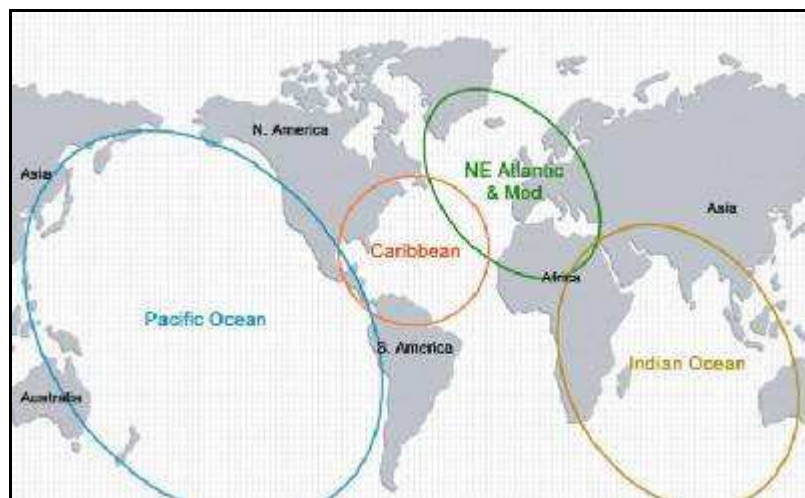


Fig. 13: Cooperation areas on tsunami warning system (source COI; UNESCO).

- **Coastal flooding :**

Shom is associated with Météo-France in the provision and improvement of an alert system to prevent from storm surges and tides named Vigilance Vagues Submersion (VVS). This allows for a better anticipation of flooding and protection of the populations living in the littoral area of Metropolitan France. An extension of that alert system towards French overseas departments is currently under work.

Shom provides the tidal predictions, development and expertise on coastal hydrodynamic and wave models, real time tide gauge observations as well as information relative to extreme sea levels and bathymetry. Météo-France's marine forecasters perform a comprehensive analysis of observation and model outputs to produce a forecast, summarized on a map depicting the level of awareness to adopt along French metropolitan department.

As an outcome of the HOMONIM Project conducted in partnership with *Météo-France*, latest up-to-date capacity for coastal flooding forecast over the area is operational since June 2017. This modelling capacity relies on :

- a storm surge model, based on barotropic version of Shom's HyCom model, with a 1 to 3 km resolution grid over the Mediterranean basin ;
- a coastal wave models based on WaveWatch-III, with a 200m-resolution unstructured grid along the domestic French coast.

The models are operated by *Météo-France* up to provide 3-day forecasts of storm surges as well as the significant height and the period of wind waves and swell. Model outputs are available on both Shom (data.shom.fr/catalogue/oceano) and *Météo-France* (donneespubliques.meteofrance.fr) data portal.

Météo-France's marine forecasters also perform a comprehensive analysis of observation and model outputs to produce a forecast, summarized on a map depicting the level of awareness to adopt along French metropolitan departments.

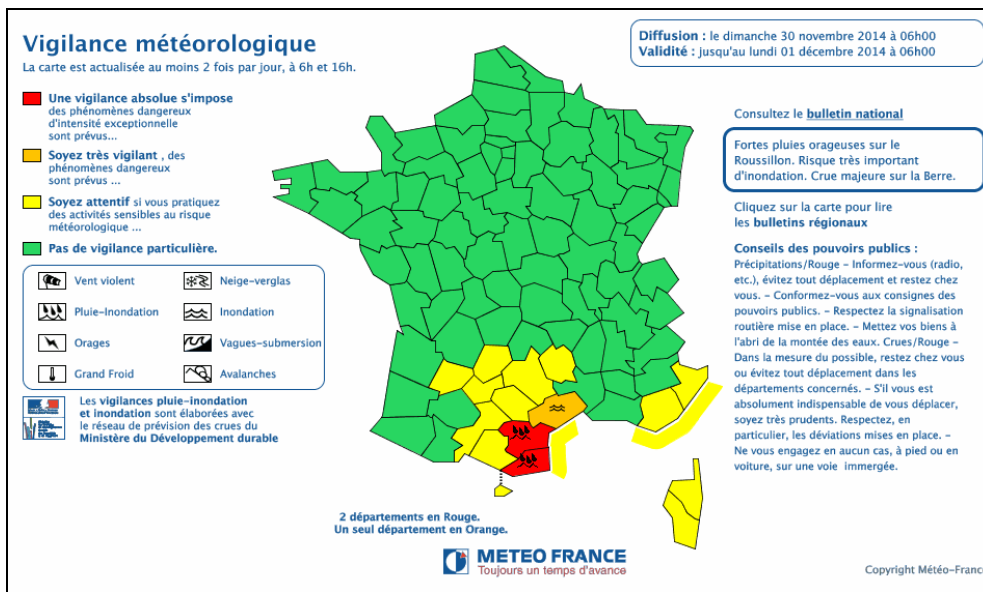


Fig. 14: An example of coastal flooding alert (yellow level).

Costs subject to alert are underlined according to the alert level (source www.meteo.fr).

• **Oil spills:**

SHOM is an active member of the inter-agency drifting committee which is activated by the maritime prefecture every time there is an oil spill. The POLMAR safety plan for the sea was signed on 23rd November 2004 and aims at enabling France to face in a reactive manner a potential wide spread of marine pollution, by ensuring the efficient coordination of national operations and support from public services.

11.5. Environmental protection

NTR.

11.6. Engagement with the Maritime Administration

NTR.

11.7. Aids to Navigation matters

NTR.

11.8. Magnetic/Gravity surveys

NTR.

11.9. International engagements

NTR.

12. Conclusions

Shom supports any initiatives aiming at improving the maritime knowledge and the navigation safety, as far as the data collected benefits the charting authorities and the update of nautical documentation of that region.

Appendix

National MSI Self-Assessment

Country: FRANCE

Organization: Shom

1. Maritime area

[Describe maritime area including details of the geographic boundaries]

The maritime area includes coastal waters of southern coast of France and Corsica.

2. Operational Points of Contact for the National Coordinator

| INSTITUTION | TELEPHONE | FACSIMILE | EMAIL |
|--|--|-----------|----------------|
| Shom , France office of the "Information and Nautical publication" department of the "Maritime Products and services" division. | +33 2 56 312 567 +33 2 56 312 187 +33 2 56 312 365 | / | na-fra@shom.fr |

3. GMDSS Master Plan

[Report on the status of the GMDSS Master Plan: Is it up to date? When was the last update?]

The French GMDSS Master Plan is compiled in the Shom publication "Maritime radiocommunications" reference n°924-RNC available on-line: <https://diffusion.shom.fr/pro/rsx-92-4-radiocommunications-maritimes-systeme-mondial-de-detresse-et-de-securite-en-mer-smdsm.html>

The publication is regularly updated (last version April 4th 2021).

[Specifics of equipment used and software version with date up-dated]

| Equipment Type for Ports and Local Area | Software Version | Date of Up-date |
|--|------------------|-----------------|
| NAVTEX station (MRCC La Garde). | Inoperative | Inoperative |
| Terrestrial radiocommunications HF, MF and VHF means | | |

[Detail the number of warnings identified as immediate priority (requiring transmission within 30 minutes) and the average elapsed time for passing to NAVAREA coordinator, as reported to the last RHC meeting]:

| Year Y-2 | | Year Y-1 | | Year Y | |
|----------|----------------------|----------|----------------------|--------|----------------------|
| Total | Average elapsed time | Total | Average elapsed time | Total | Average elapsed time |
| NTR | NTR | NTR | NTR | NTR | NTR |

4. NAVTEX Coverage:

[Diagram of NAVTEX stations and service areas within maritime area; Contact details for NAVTEX Stations; Confirm operational status has been validated.]

MRCC La Garde tel : +33 4 94 61 71 10 lagarde@mrc CFR.eu - Inoperative since January 2020.

5. Operational Issues:

[New infrastructure in accordance with GMDSS Master Plan; Problems encountered?]

MRCC La Garde NAVTEX station has been off air since January 2020, and NAVAREA III coordinator has kindly undertaken the broadcasting of some coastal warnings on its behalf in Mediterranean Sea via SafetyNET technology. Unfortunately, the failure of La Garde NAVTEX transmitter will not be resolved in the near future. As a consequence, this mitigating situation, commanded by the need to maintain the dissemination of maritime safety information, hence to ensure the safety of navigation, might last over several months.

The French Directorate of Maritime Affairs is investigating various options that might be used to recover the autonomy of La Garde broadcasting capacity.

6. Contingency Planning

[Provide information regarding contingency plans that have been established and future plans where appropriate. Also report on any testing of the plan that has been conducted]

NTR.

7. Capacity Building

[Demands for Capacity Building, Training requested or received, any offered, status of national, bilateral, multilateral or regional development projects with MSI component]

Not applicable.

8. Other Activities

[Participation in other IHO or IMO Working Groups, Regional Hydrographic Commissions, regional conferences related to MSI over past year]

Shom participates to IHO and IMO Working Groups, Regional Hydrographic Commissions and the regional conferences related to MSI over past year (SMAN12, MSC7).

9. National Maritime Website

[(Address, statistics (if permitted by national legislation; how often is the information on your web site updated? Do you display the date and time of the last update on your web site?)]

10. Recommendations

[If any]

11. Summary

[Please provide a short summary of this paper which will be included in the final report of the meeting.]

Destinataires : OHI – MBSHC Chair (IHM)

Copies intérieures : DG – DMI - DMI/REX – Archives (DMIDSD/2.018)
