

Direction des missions institutionnelles et
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Division relations extérieures

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N° 10 Shom/DMI/REX/NP

NATIONAL REPORT FROM FRANCE TO THE 16TH CONFERENCE OF THE SOUTH AFRICAN AND ISLANDS HYDROGRAPHIC COMMISSION (SAIHC)

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.

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 is currently carrying out survey works with the French Navy Survey Vessel BHO *Beautemps-Beaupré* in the French overseas departments & territories in the Mozambique channel (June - September 2019). Surveys are ongoing and will be presented at the next meeting.

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.

Most of the French overseas coasts in the Indian Ocean within the region have been surveyed: Mayotte, Îles Eparses and La Réunion. These data, critical for coastline management and risks prevention, are freely available through:

- ❖ Shom's data portal : <http://diffusion.shom.fr/pro/risques/altimetrie-littorale.html>
 - For Mayotte: <http://diffusion.shom.fr/pro/risques/altimetrie-littorale/litto3d-mayot2012.html>
 - For Îles Eparses: <http://diffusion.shom.fr/pro/risques/altimetrie-littorale/litto3d-eparses2012.html>

- For La Réunion: <http://diffusion.shom.fr/pro/risques/altimetrie-littorale/litto3d-reunion2016.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 overseas territories and areas under French responsibilities to update nautical charts.

Hydrographic vessel *Beautemps-Beaupré* will be deployed in the Indian Ocean in 2021. Pursuing the cooperation with Madagascar is one of the objectives of this upcoming campaign.

2.4. New ships

NTR.

2.5. Problems encountered

Following the refusal of the Malagasy authorities to grant a favourable response to the French request to carry out hydrographic surveys in the waters under the jurisdiction of the Republic of Madagascar (request made in accordance with the provisions of the 1982 United Nations Convention on the Law of the Sea related to marine scientific research), the BHO *Beautemps-Beaupré* campaign to improve navigation safety, in particular for access to the ports of Fort-Dauphin (Toalagnaro) and Tulear (Toliara) and the Nosy Bé region, as well as to the Banc de l'Étoile (south of Madagascar), was cancelled.

3. New charts & updates

3.1. ENC's

As of 1st July 2019, Shom has produced 689 ENC's, of which 58 ENC's within region H.

The full collection should eventually reach around 900 ENC's, with an approximate rate of 50 new cells per year.

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

The current status of ENC production in the region H is detailed in the table and chartlet hereafter (*changes in red*):

Usage Band	Produced Cells	Planned Cells	Percentage
1	0	1	0
2	7	7	100
3	6	9	67
4	19	20	95
5	20	28	93
6	6		
Total	58	65	89

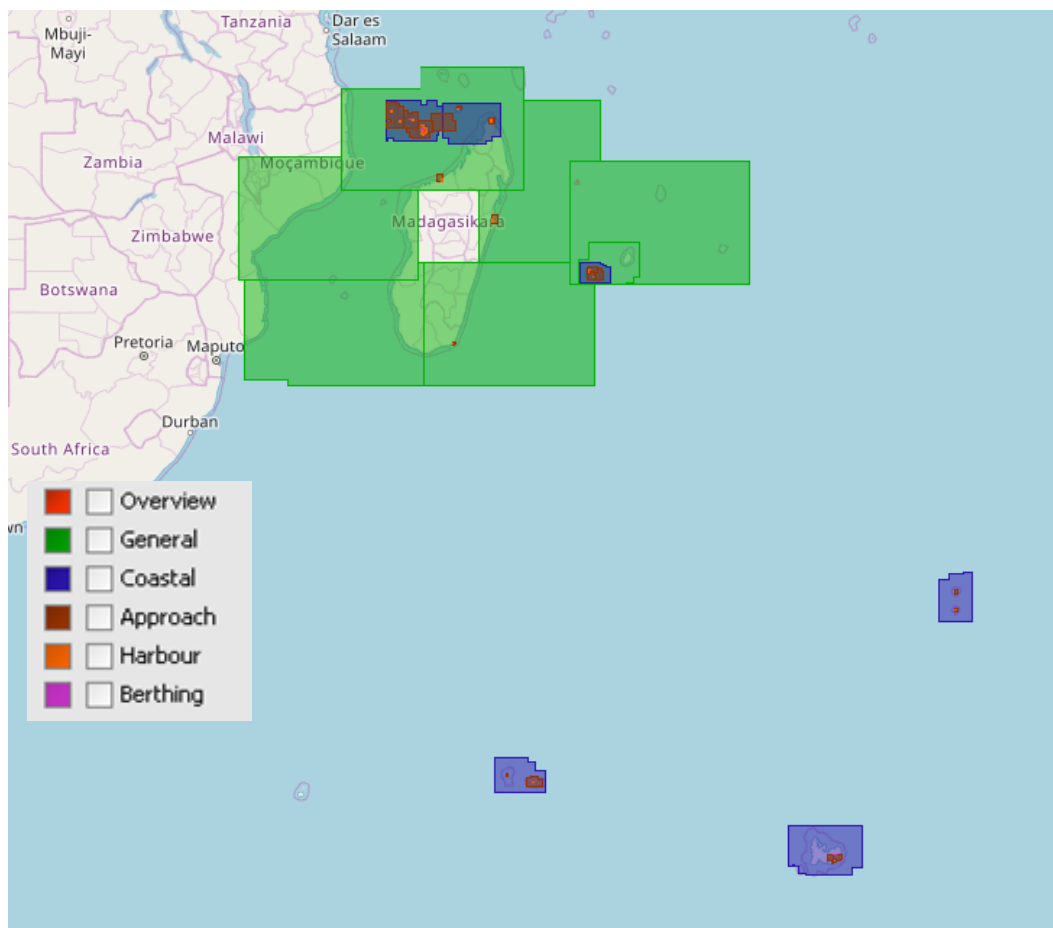


Fig.3: SHOM's ENC production within Region H (source: Primar online catalogue).

3 ENC's were produced since the last conference:

Number	Scale 1:	Title
FR274870	700 000	<i>Approches Nord-Est de Madagascar</i>
FR472400	45 000	<i>Îles Glorieuses</i>
FR57240A	12 000	<i>Approches Nord de l'Île Glorieuse</i>

Here is the list of ENC's planned to be produced over the period 2019-2021:

Number	Scale 1:	Title	Comment
FR176040	4 000 000	<i>Îles Crozet, Kerguelen St Paul et Amsterdam</i>	Scheduled in 2019 French EEZ
FR36643D	90 000	<i>Îles Bassas da India</i>	
FR46643C	45 000	<i>Île Europa</i>	
FR56643B	12 000	<i>Mouillage nord d'Europa</i>	
FR56643A	12 000	<i>Île Juan de Nova</i>	
FR348520	90 000	<i>De la rivière Antsena au Cap Tanjo (Baie de Bombetoka)</i>	Scheduled in 2019 Ought to replace GB300701
FR361560	90 000	<i>De l'île Sainte-Marie à Tamatave</i>	Ought to replace GB300678

3.2. ENC Distribution method

All French ENC's (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

Here the overall INT chart production status for that region H (*changes in red*):

Scale	Produced INT charts	Planned INT charts	%
Small (<1/1 000 000)	6	6	100
Medium	5	7	71
Large (>1/100 000)	5	5	100
Total	16	18	89

See next section (3.5) for details (charts produced and production plan for the period 2019-2020).

Regarding printer nation status, a bilateral arrangement was established between the Government of India and the Shom for the exchange and reproduction of nautical products. Shom became a printer nation of the INT7739 (IN2514), covering Port Louis and its approaches, and INT7737 (IN2527) covering Mauritius Island.

3.5. National paper charts

Since the last SAIHC meeting, the following charts have been edited:

National	INT	New chart (NC) or new edition (NE)	Scale 1:	Title
7487	7062	NC	1 000 000	Approches Nord-Est de Madagascar
7171	7748	NE	350 000	Approches des îles Saint-Paul et Amsterdam
6497	/	NE	75 000	Île de la Possession - Île de l'Est

Besides, the following charts are planned for the 2019-2020 period:

National	INT	New chart (NC) or new edition (NE)	Scale 1:	Title
6741	7749	NE (2019)	300 000	Îles Kerguelen
6498	7747	NE	250 000	Îles Crozet
7170	/	NE	30 000	Îles Saint-Paul et Amsterdam
6643	/	NE	div	Îles et récifs du Canal du Mozambique
7240	/	NC	50 000	Îles Glorieuses
7350	/	NE	150 000	Récif du Geysier - Banc de la Zélée
tba	/	NC	div	Approche et rade de Tuléar (Toliara)
tba	/	NC	div	Abords de Fort-Dauphin (Taolagnaro)

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. Problems encountered

NTR.

4. New publications & updates

4.1 New Publications

NTR.

4.2. Updated publications

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

A new edition of the L8 “Afrique (côte Est) - De Cape Agulhas à Ras Hafun” sailing instructions will be published in September 2019.

4.3. Means of delivery

All nautical publications are available in digital format only (pdf files) on Shom’s online shop (diffusion.shom.fr).

4.4. Problems encountered

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. New infrastructure in accordance with GMDSS Master Plan

There is no NAVTEX station related to French overseas territories, MSI warnings are broadcast through SafetyNet network.

5.3. Problems encountered

NTR.

6. C-55 Latest update

The latest overall C-55 update has been transmitted to the IHO Secretariat on April 26th 2019 for the Survey Status.

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 April 2019	Depth < 200m			Depth > 200m		
	A	B	C	A	B	C
H Illes Éparses - France (Bassas de India, Europa et Juan de Nova)	8.9	2.4	88.7	20.0	0.0	80.0
H Mayotte et Glorieuses - France	19.2	80.8	0.0	49.5	0.0	50.5
H La Réunion et Tromelin - France	66.1	33.9	0.0	26.3	0.0	73.7

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

H	Terres Australes françaises (Crozet, Kerguelen, Amsterdam, Saint-Paul)	0.4	5.6	94.0	11.5	0.0	88.5
H	Comores (Union des)	13.9	8.1	78.0	35.6	0.0	64.4
H	Madagascar (République de)	0.1	8.7	91.2	14.4	0.0	85.6

C-55 values for survey status. Updated values are highlighted in red.

Charting Status Updated July 2019	Small (<1 M)			Medium (1M < / < 100 000)			Large (> 100 000)			Metric	WGS84	
	A	B	C	A	B	C	A	B	C			
J	Iles Éparses - France (Bassas de India, Europa et Juan de Nova)	100	0	NA	0	0	0	0	0	0	100	100
J	Mayotte et Glorieuses - France	100	0	100	100	0	100	75	0	100	100	100
J	La Réunion et Tromelin - France	100	0	NA	100	0	100	100	0	100	100	100
J	Terres Australes françaises (Crozet, Kerguelen, Amsterdam, Saint-Paul)	100	0	NA	100	0	83,33	56	0	44,4	100	100
J	Comores (Union des)	100	0	100	100	0	100	20	0	0	100	100
J	Madagascar (République de)	100	0	100	10	0	7,69	80	0	66,6	100	100

C-55 values for charting status. 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.

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

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)
Admission: based on diplomas or competitive exam
Curriculum: see: www.ensta-bretagne.fr

Logos: Cti, EUR-ACE, FIG, ICA, CAP

www.shom.fr
@shom_fr | shom.fr | shom_fr

Fig.4: Courses and training provided at the Shom hydrographic school (source: shom.fr)

7.2. 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.

Within the SAIHC area, a bilateral arrangement of this kind is concluded between France and the Union of Comoros (renewal underway), and one is under discussion with the Republic of Madagascar.

An arrangement for the exchange and reproduction of nautical products, in accordance with IHO Resolution 7/1919 as amended (former A3.4) has been concluded with the National Hydrographic Office of India (INHO) on March 8th 2018 (updated on June 5th 2018).

7.3. Definition of bids to IHO CB Work Programme

France will contribute to the visits under the 2020 capacity building work programme:

- Technical visit to Comoros (CBWP2020 activity A-03, not yet funded)
- High level and technical visit to Madagascar (CBWP2020 activity A-05, not yet funded)

in order to raise the profile of hydrography and to offer technical assessment of capabilities.

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>

8.2. Tide gauge network

Shom is the national coordinator and reference authority for the observation of the sea level, managing and issuing the resulting data. The RONIM network, managed by Shom, covers the SAIHC region:

- Réunion : Pointe des Galets & Sainte-Marie ;
- Mayotte : Dzaoudzi;
- Madagascar : Toamasina (owned by Madagascar Met. Office and operated by Shom);

Kerguelen : Port-au-Français (LEGOS/ROSAME)

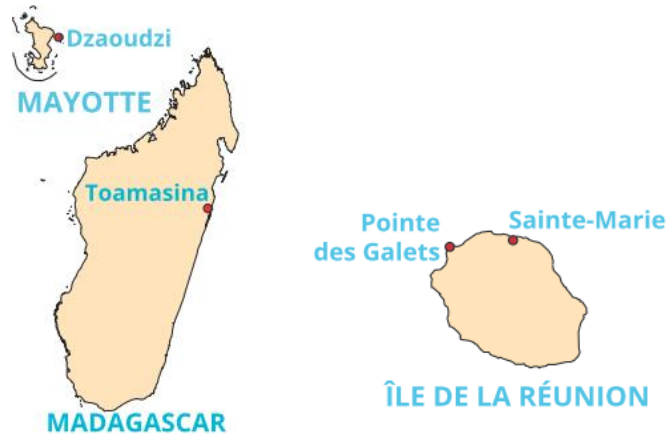


Fig.5: Shom tidal stations in SAIHC region (source shom.fr).

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.

Shom's tidal predictions are available through a new 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. Problems encountered

NTR.

9. Other activities

9.1. Participation in IHO Working Groups

See §9.9 International.

9.2. Meteorological data collection

NTR.

9.3. Geospatial studies

NTR.

9.4. Disaster prevention

France may have Navy ships in the SAIHC 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.

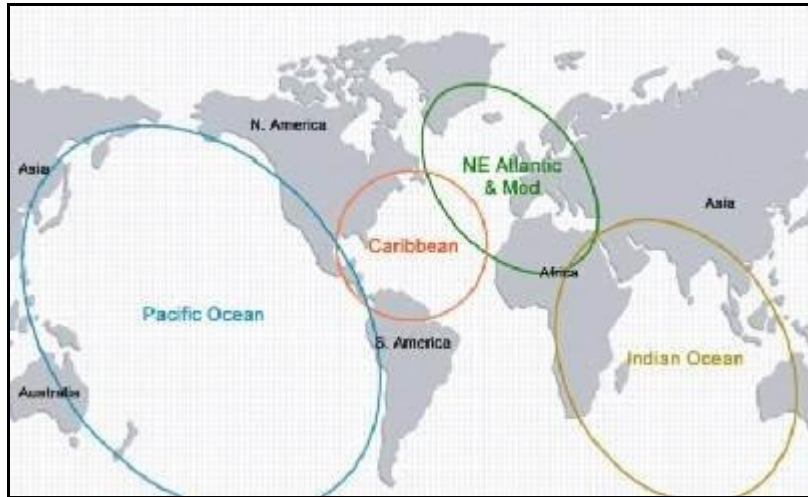


Fig.6: Cooperation areas on tsunami warning system (source COI; UNESCO).

- **Coastal flooding :**

Shom is associated with *Météo-France* in the provision and improvement of an alert system against 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.

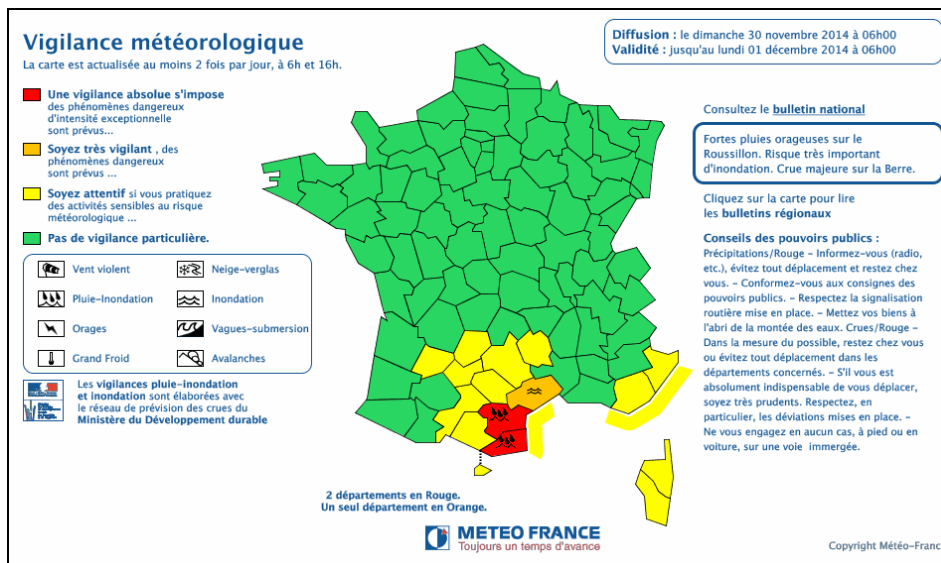


Fig.7: An example of coastal flooding alert (yellow level).

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

As an outcome of the HOMONIM Project conducted in partnership with *Météo-France*, a first full capacity for coastal flooding forecast is operationally implemented at *Météo-France* since May 2017. This modelling capacity relies on:

- a storm surge model, based on Shom's HyCom barotropic model, with a 3-km resolution grid;
- two coastal wave models based on WaveWatch-III, with a 200m-resolution unstructured grid around the French overseas territories of La Réunion and Mayotte, nested in the regional wave model MFWAM of *Météo-France*.

A second version of the storm surge model is under development, based on a nested suite of three HyCom configurations with increasing resolution up to 800m around La Reunion and 200m around Mayotte, using specific updated bathymetric DTM.

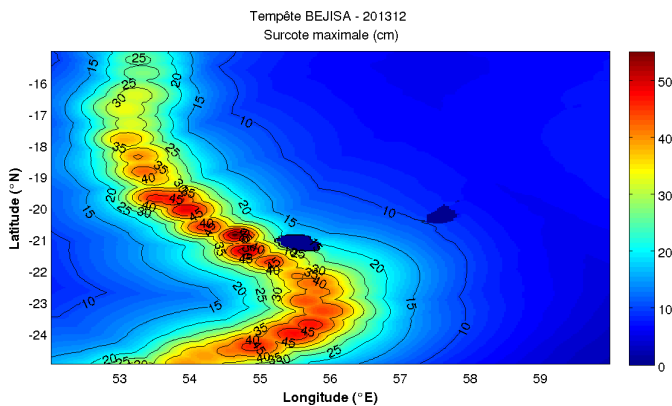


Fig.8: maximum storm surge on Bejisa (dec; 2012) cyclone pathway (source HOMONIM project).

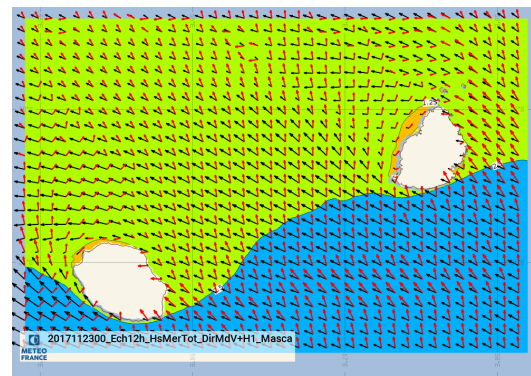


Fig.9: Example of 12-hours forecast of full sea state (black) and wind wave (red) height and direction on Nov 23rd 2017 at noon around Mascarene Islands (source HOMONIM project).

- **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 manor a potential wide spread of marine pollution, by ensuring the efficient coordination of national operations and support from public services.

9.5. Environmental protection

NTR.

9.6. Astronomical observations

NTR.

9.7. Magnetic/Gravity surveys

NTR.

9.8. MSDI Progress

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. Hereafter are listed some of the latest evolutions:

- Improved content for oceanographic data : finer description of swell characteristics, automatic and tailored oceanographic report
- Improved cartographic tools
- Timeline function : time synchronisation of layers to produce animated features
- New layer on administrative limits
- New bathymetric terrain models: Clipperton island, Guadeloupe and Martinique islands, La Reunion island
- Maritime archives: old charts and survey sheets have been scanned and are now available on the web site

Since December 3rd 2017, 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 are distributed under Creative Commons « CC-BY-SA 4.0 » licence.

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

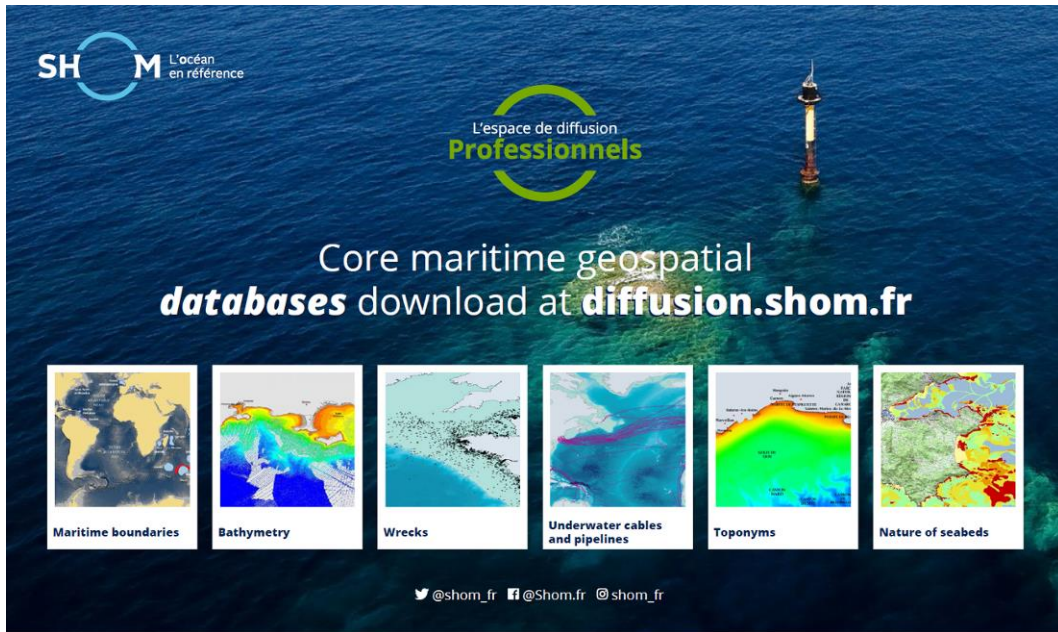


Fig.10: open data (diffusion.shom.fr)

A detailed description of the portal functions and contents is available on Shom website (<http://www.shom.fr/les-services-en-ligne/portail-datashomfr/>).

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 these information are available on SAIHC region.

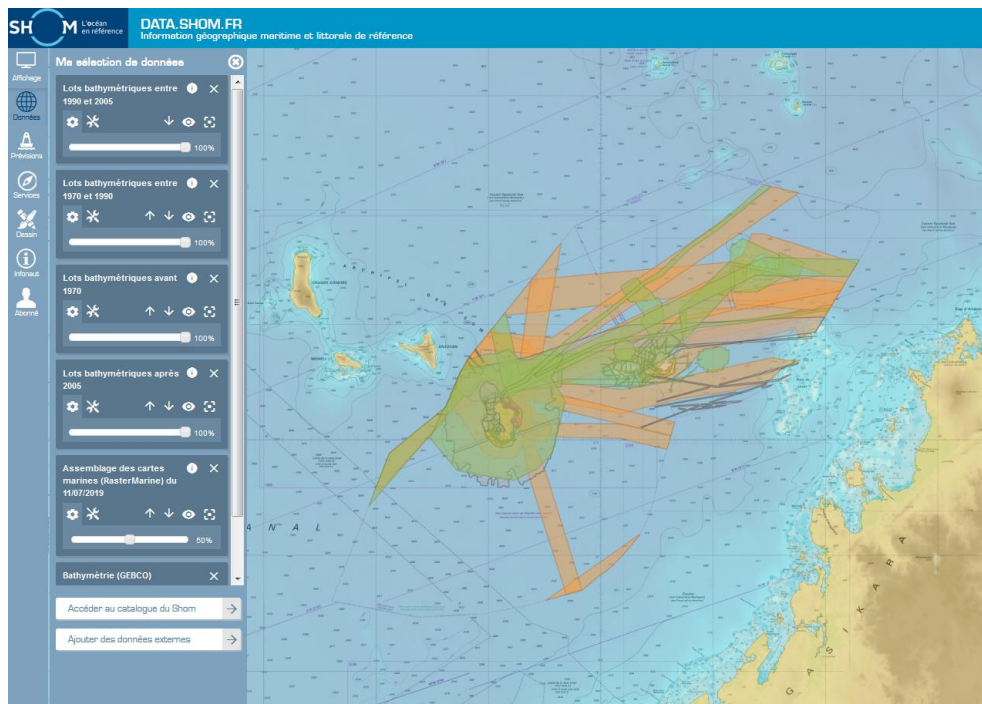


Fig.11: Bathymetric data (Shom surveys) over French EEZ (data.shom.fr)

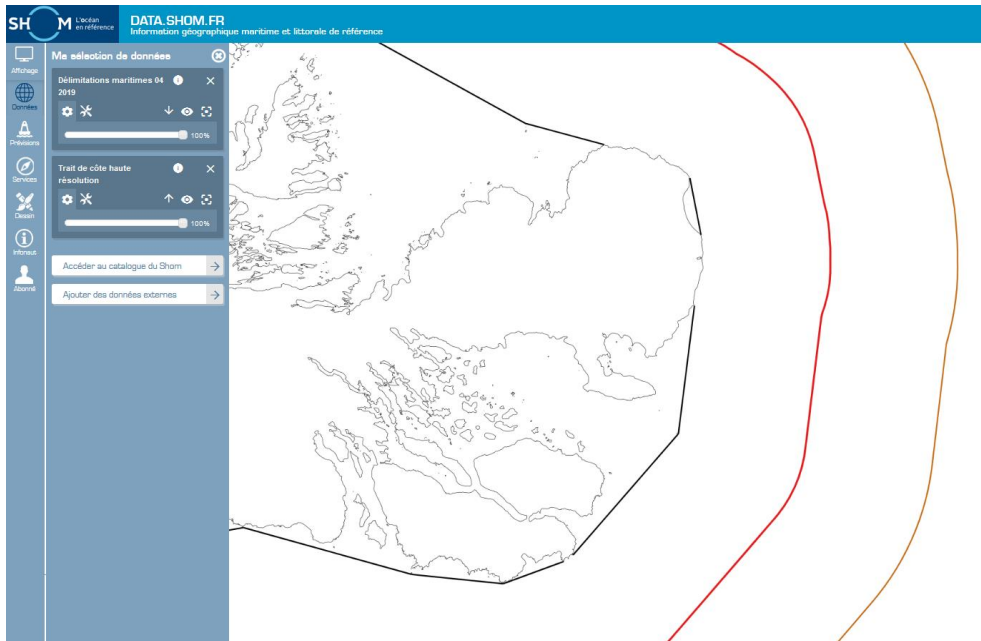


Fig.12: Kerguelen Island – High resolution shoreline and maritime limits (data.shom.fr)

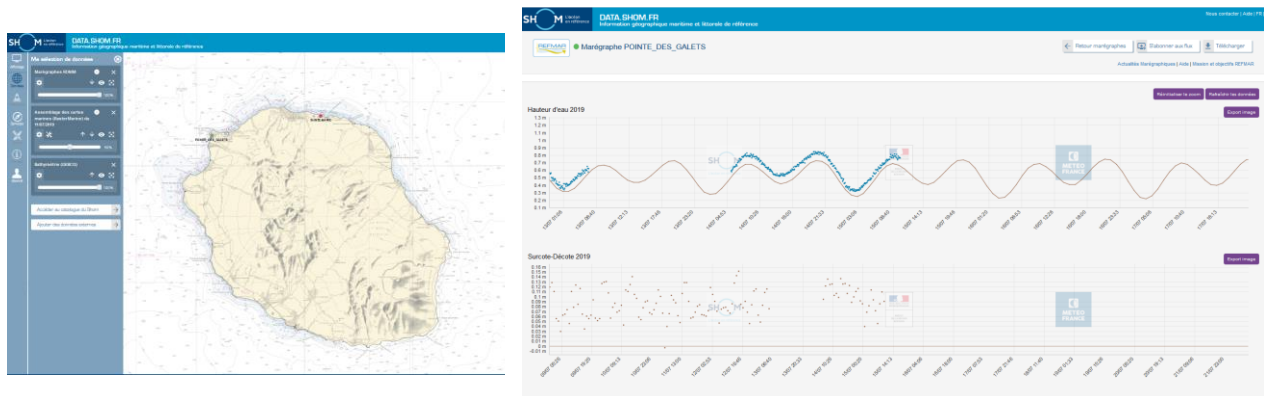


Fig.14: REFMAR Sea level observation and prediction (data.shom.fr)

On Friday 8 June 2018, on the occasion of World Ocean Day, the Shom and the General Secretariat for the Sea (SG Mer) opened the French maritime limits portal: <https://limitesmaritimes.gouv.fr/>

Operated by Shom as the national expert and reference body for maritime delimitation, this portal is coordinated under the umbrella of the SG Mer. It aims to be the national site for consultation and diffusion of the official information on the maritime delimitations of France, particularly the legal references and digital data.

Accès à l'ensemble des informations officielles
sur les délimitations maritimes de la France



Fig.15: French maritime limits portal

9.9. International

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 (former CPSCWG)
ENCWG		✓	ENC Working Group (former TSMADWG/DIPWG)
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, formerly known as the Committee on Hydrographic Requirements for Information Systems (CHRIS)
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 (former SNPWG)

NSHC		✓	North Sea Hydrographic Commission
RSAHC		✓	ROPME Hydrographic Commission
S100WG		✓	S-100 Working Group (former TSMADWG/DIPWG)
SAIHC		✓	Southern Africa and Islands Hydrographic Commission
HSPT	✓		S-44 Hydrographic surveys Project Team
SWPHC		✓	South-West Pacific Hydrographic Commission
TWCWG	✓	✓	Tidal, Water Level and Currents Working Group (former TWLWG/SCWG)
WEND		✓	World-Wide Electronic Navigational Chart Database
WWNWS		✓	World-wide Navigational Warning Service Sub-Committee, formerly known as the Promulgation of Radio Navigational Warnings Sub-Committee (PRNW)

10. 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.

Destinataire : OHI

Copies intérieures : DG - DMI - DMI/REX - GHOA - Archives (DMIDSD/2.033)
