REPORT

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NATIONAL REPORT FROM FRANCE TO THE 17TH 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. 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 Indian Ocean and the current surveys coverage for this area.

Between June and September 2019, surveys have been carried out in the Mozambique channel and around Mayotte island (see coverages hereunder).

2019 survey - Europa island :

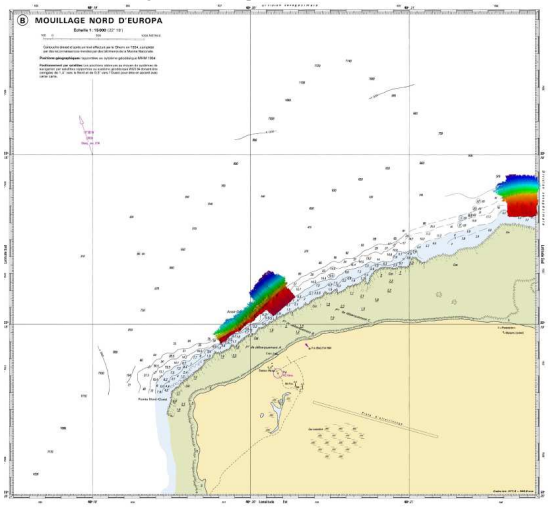

Fig. 1: Survey coverage off Europa Island

2019 survey - Juan De Nova island :

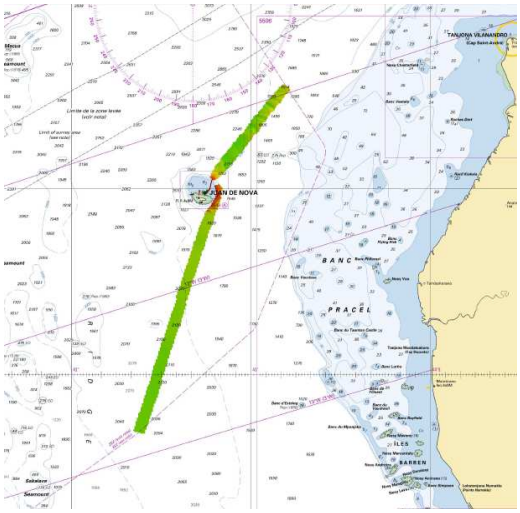

Fig. 2: Survey coverage off Juan de Nova Island

2019 survey – Mayotte island and Geyser reef :

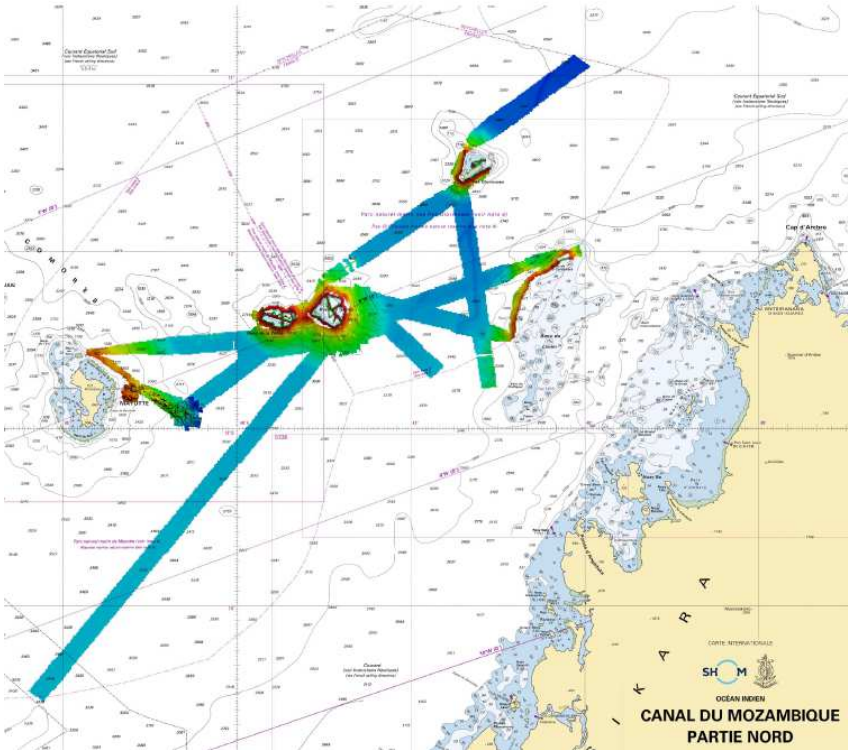

Fig. 3: Survey coverage off Mayotte and Glorioso Islands

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.

In 2021, hydrographic survey is planned around Mayotte island with French hydrographic vessel *Beautemps-Beaupré*, and a geophysical and acoustic campaign is planned in the Mozambique channel (between Mozambique and Juan de Nova) with French oceanographic vessel *Pourquoi pas ?*.

French hydrographic vessel *Beautemps-Beaupré* will also be deployed in the Indian Ocean in 2023.

2.4. New ships

NTR.

2.5. Crowdsourced and satellite-derived bathymetry – national policy

Crowdsourced bathymetry

Shom is currently translating the IHO B-12 (Guidance on Crowdsourced Bathymetry) into French.

Satellite-derived bathymetry

Shom has decided to consolidate his experience on satellite-derived bathymetry with an innovation partnership launched at the end of 2018 and dedicated to the upgrading of Shom's production line including algorithms based on recent methods. This public contract includes 3 stages: research, development and industrialization.

The first step was completed in March 2020 and allowed to define a strategy based on the assessment of accuracy of the different inversion methods evaluated.

The second step will be launched at the beginning of 2021.

2.6. Challenges and achievements

Following abnormal seismic activities since May 2018, scientific surveys, analysis and monitoring have been organized by French authorities and scientific organizations. Shom has contributed to this monitoring with a timely bathymetric survey in July 2019 and will continue to contribute as much as possible, especially in 2021 during the deployment of French hydrographic vessel *Beautemps-Beaupré*.

3. New charts & updates

3.1. ENCs

As of 1st December 2020, Shom has produced 757 ENCs, of which 62 ENCs within region H.

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.

The current status of ENC production in the region H is detailed in the table and chartlet hereafter (*changes in red*) – the main update for planned cells comes from the decision to produce ENCs for Îles Kerguelen:

Usage Band	Produced Cells	Planned Cells	Percentage
1	0	1	0
2	7	**8**	**88**
3	**7**	**15**	**47**
4	**21**	**34**	**62**
5	**21**	**43**	**49**

6	6	**15**	**40**
Total	**62**	**116**	**53**

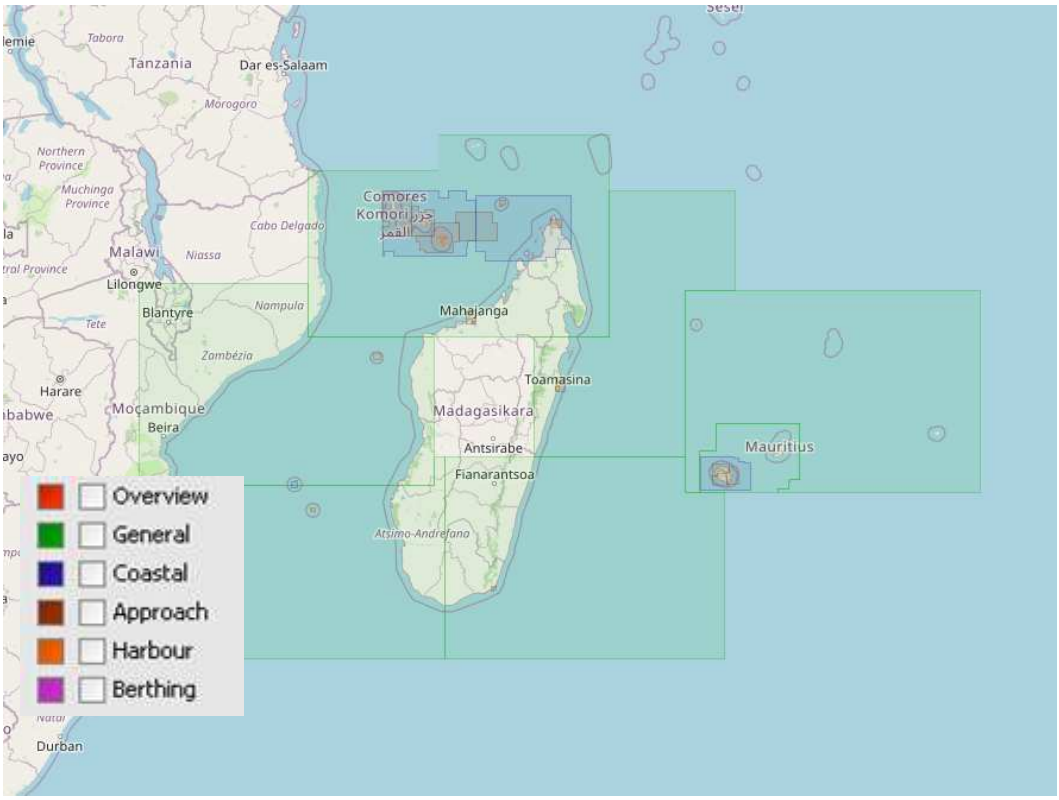

Fig. 4: Shom's ENC production within Region H (source: Primar online catalogue)

4 ENCs were produced since the last conference:

Number	Scale 1:	Title
FR36643D	90 000	*Îles Bassas Da India*
FR46643A	45 000	*Île Juan de Nova*
FR46643C	45 000	*Île Europa*
FR56643B	12 000	*Mouillage nord Europa*

The list of ENCs planned to be produced over the period 2021-2022 is provided below:

Number	Scale 1:	Title	Comment
FR176040	4 000 000	*Îles Crozet, Kerguelen St Paul et Amsterdam*	**Scheduled in 2021** French EEZ
Iles Kerguelen			
FR478270	45 000	*Golfe des Baleiniers – De l'île du Veau Marin au Cap Rouge*	**Scheduled in 2022**
FR57827A	22 000	*Bras de la Fonderie*	**Scheduled in 2022**
FR67827B	12 000	*Port Couvreux*	**Scheduled in 2022**
FR57827C	22 000	*Baie du Hopeful*	**Scheduled in 2022**
FR57828A	12 000	*Baie de l'Oiseau - Port Christmas*	**Scheduled in 2022**
FR57828B	22 000	*Port Edmond Perrier et Anse de l'Excursion*	**Scheduled in 2022**
FR57828C	22 000	*Anse du Jardin*	**Scheduled in 2022**

FR57828D	22 000	*Baie du Brise-Lames*	**Scheduled in 2022**
FR57828E	22 000	*Port Matha*	**Scheduled in 2022**
FR57828F	22 000	*Port Jules Girard*	**Scheduled in 2022**
FR57828G	22 000	*Ports Fallières et Fuller*	**Scheduled in 2022**
FR57828H	22 000	*Côte Nord-Est de la Presqu'île Joffre*	**Scheduled in 2022**
FR57828I	22 000	*Baie du Hopeful - Mouillage Bon-Abri*	**Scheduled in 2022**
FR67828J	8 000	*Baie du Hopeful - Cascade Lozère*	**Scheduled in 2022**
FR67828K	8 000	*Baie du Yatch Club*	**Scheduled in 2022**
FR57828L	22 000	*Baie Doumergue*	**Scheduled in 2022**
FR57828M	22 000	*Port d'Hiver*	**Scheduled in 2022**
FR57828N	12 000	*Port Élisabeth*	**Scheduled in 2022**
FR57828O	8 000	*Port Jeanne d'Arc*	**Scheduled in 2022**
FR67828P	12 000	*Fjord des Portes Noires*	**Scheduled in 2022**
Madagascar			
FR348520	90 000	*De la rivière Antsena au Cap Tanjo (Baie de Bombetoka)*	**Scheduled in 2021**
FR352640	350 000	*De la Pointe d'Andemby à la Pointe d'Angadoka - Abords de Nossi-Bé*	**Scheduled in 2021**
FR353390	350 000	*De Majunga à Nossi-Bé*	**Scheduled in 2021**
FR359620	350 000	*De Tuléar au Cap Sainte-Marie*	**Scheduled in 2021**
FR359760	90 000	*Du Cap Andavaka à Sainte-Luce*	**Scheduled in 2021**
FR361550	90 000	*Abords de l'île Sainte-Marie*	**Scheduled in 2021**
FR361560	90 000	*De l'île Sainte-Marie à Tamatave*	**Scheduled in 2021**
FR454760	90 000	*De la Baie du Courrier à la Baie du Rodo*	**Scheduled in 2021**
FR363130	45 000	*Canal de Sainte-Marie - Partie Nord*	**Scheduled in 2021**
FR363150	45 000	*Canal de Sainte-Marie, partie Sud*	**Scheduled in 2021**
FR363160	45 000	*De l'île Sainte-Marie à Fénérive*	**Scheduled in 2021**
FR56054B	12 000	*Mouillage d'Itapère*	**Scheduled in 2021**
FR563070	8 000	*Ambodifototra (Port Sainte-Marie)*	**Scheduled in 2021**

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 that region H (*changes in red*) is provided below:

Scale	Produced INT charts	Planned INT charts	%

Small (<1/1 000 000)	6	6	100
Medium	**7**	7	**100**
Large (>1/100 000)	5	5	100
Total	**18**	18	**100**

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

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
6498	7747	NE	250 000	Îles Crozet
6741	7749	NE	300 000	Îles Kerguelen
7170	/	NE	30 000	Îles Saint-Paul et Amsterdam
7490	7710	NE	350 000	Archipel des Comores

Besides, the following charts are planned for the 2021-2022 period:

National	INT	New chart (NC) or new edition (NE)	Scale 1:	Title
6498	7747	NE (2021)	250 000	Îles Crozet
6643	/	NE (2021)	div	Îles et récifs du canal de Mozambique
7171	7748	NE (2021)	350 000	Approches des îles Saint-Paul et Amsterdam
7240	/	NC (2021)	50 000	Îles Glorieuses
7492	/	NE (2021)	35 000	Île de Mayotte - Partie Nord
7493	/	NE (2021)	35 000	Île de Mayotte - Partie Est
7494	/	NE (2021)	35 000	Île de Mayotte - Partie Ouest
7827	/	NC (2022)	div	Îles Kerguelen (moyenne et grande échelle)
7828	/	NC (2022)	div	Îles Kerguelen (moyenne et grande échelle)

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 licenses[1] according to the purpose of use. These data can be used with GIS or cartographic software for commercial or private purposes.

A S-57 license[2] allows the download of updated versions for 12 months from the date of purchase.

[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*

3.7. Challenges and achievements
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.

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. 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.
The Shom only plays a control and coordination role of local and coastal warnings issued by its national delegated coordinators (maritime zone commands mentioned in Appendix)).

5.3. 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.

5.4. Challenges and achievements
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 H areas under Shom responsibility are summed up in the following tables:

Survey Status **Updated December 2020**		**Depth < 200m**			**Depth > 200m**		
		A	**B**	**C**	**A**	**B**	**C**
H	Iles Éparses - France (Bassas de India, Europa et Juan de Nova)	5.6	1.7	92.7	15.5	0.5	84.0
H	Mayotte et Glorieuses – France	31.2	62.5	6.3	54.5	0.3	45.2
H	La Réunion et Tromelin – France	72.8	23.7	3.5	33.8	0.0	66.2

H	Terres Australes françaises (Crozet, Kerguelen, Amsterdam, Saint-Paul)	10.0	29.8	60.2	21.6	0.9	77.5
H	Comores (Union des)	22.5	6.4	71.1	31.8	0.0	68.2
H	Madagascar (République de)	0.5	8.5	91.0	14.7	0.2	85.1

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

Charting Status **Updated December 2020**		**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	100	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	81	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 courses[3] 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

Fig. 5: 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.

7.3. Definition of proposals and requests to the IHO CBSC

Due to the covid-19 crisis, the following actions, foreseen in the CBWP2020, could not be carried out by France:

- Technical visit to Comoros (CBWP2020 activity A-03);
- High level and technical visit to Madagascar (CBWP2020 activity A-05).

The possibility of postponing these two activities to the year 2021 will be studied.

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.
DTM of La Reunion and Mayotte have also been provided to GEBCO (see GEBCO Grid and IHO DCDB website).

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:

- La 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)

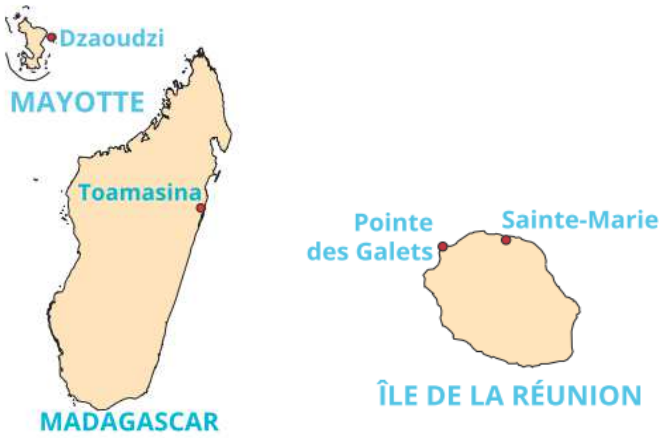

Fig. 6: Shom tidal stations in SAIHC region (source shom.fr)

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. Challenges and achievements

Since May 2018, the island of Mayotte has been undergoing a "seismic crisis". Several dozen earthquakes, some of which were felt by the population, have been recorded since that date and located in an area about 50 km east of the island. These earthquakes have been associated with the appearance of an underwater volcano in the zone of origin of the seismic activity.

As a consequence of this seismic crisis, a very significant subsidence of the island of Mayotte is observed. The surface displacements measured since the beginning of the crisis by the GPS stations of Mayotte indicate: a) an overall displacement of the GPS stations of Mayotte towards the east of about 21 to 25 cm; b) a subsidence of about 10 to 19 cm depending on their location on the island. A slowing of the movements has been observed since April-May 2019.

The phenomenon of subsidence results in a mechanical apparent rise of the mean sea level. Nonetheless, the absolute level (i.e. measured in relation to a fixed reference) does not vary significantly.
In the current state of the phenomenon, which is still ongoing, it is too early for Shom to reassess its tidal predictions. This will have to be done after a sufficiently long stabilisation period and on the basis of new observations.

In the meantime, users of Mayotte should be recommended to add the value of sinking to Shom's tidal predictions.

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

NTR.

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

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.

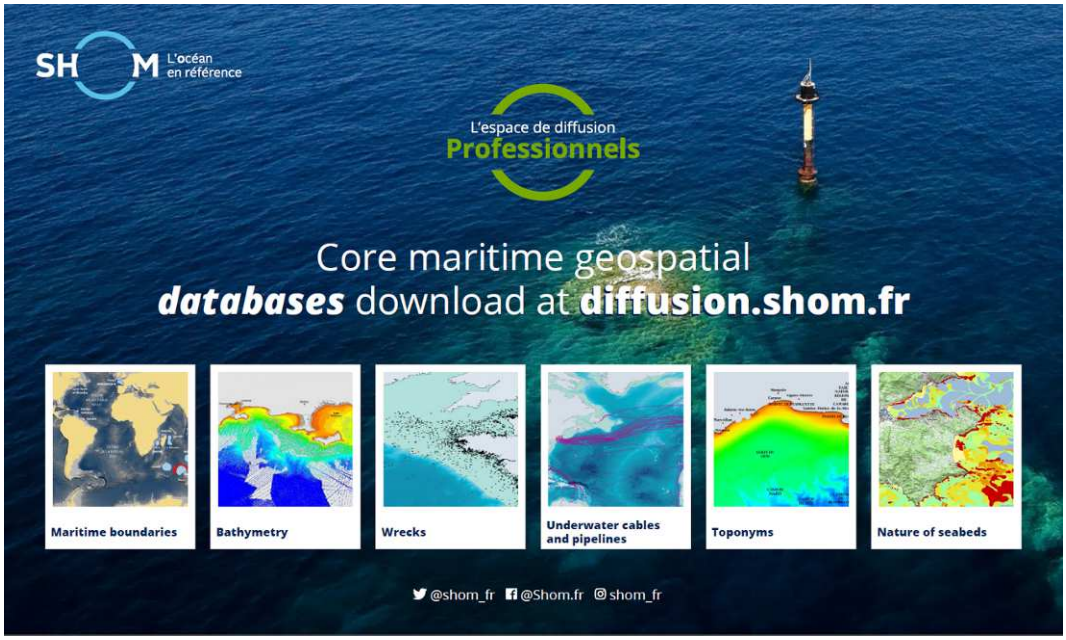

Fig. 7: open data (diffusion.shom.fr)

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 these information are available on SAIHC region.

Hereafter are listed some of the latest evolutions:

- Annual edition of wrecks and obstructions layer, tides predictions…
- Limits related to fishery uses (3 and 100 NM)
- Limit of the preventive archeology licence fee (1 NM)
- Outer limit of the territorial sea of Mayotte
- Maritime Altimetric References
- 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).

A detailed description of the portal functions and contents is available on Shom website (https://services.data.shom.fr/support/fr).

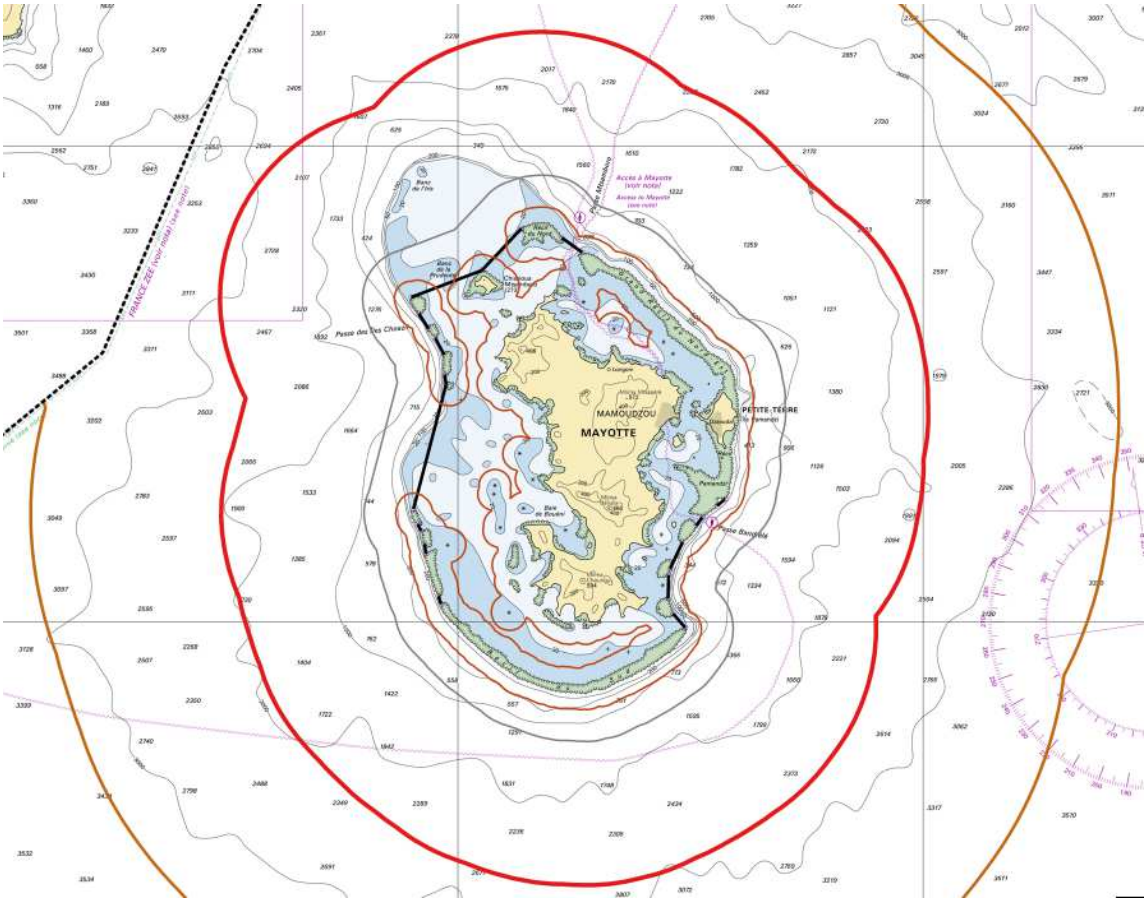

Fig. 8: Maritime limits off Mayotte Island including 1, 3 and 100 NM (data.shom.fr)

These maritime limits are also available on the French maritime limits portal: https://maritimelimits.gouv.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 DriX drones from IX Blue; deep-sea and shallow water AUV, 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 "Deseasion 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
HSPT	✓		S-44 Hydrographic surveys Project Team
SWPHC		✓	South-West Pacific Hydrographic Commission
TWCWG	✓	✓	Tidal, Water Level and Currents Working Group
WEND		✓	Wold-Wide Electronic Navigational Chart Database
WWNWS		✓	World-wide Navigational Warning Service Sub-Committee

Representation of SAIHC at IENWG:
France represents the SAIHC at IENWG since its creation. Although the main topic of the IENWG is to deal with European Union policies, activities and processes of HO's interest, the impacts of these activities go beyond Europe. As an illustration, the EMODnet EU initiative, which celebrated its 10th anniversary in 2020, provides a worldwide data index (CDI) and a Bathymetry World Base layer produced in cooperation with the GEBCO. It should be noted that Shom pilots the bathymetric part of the EMODNET programme.

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 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.

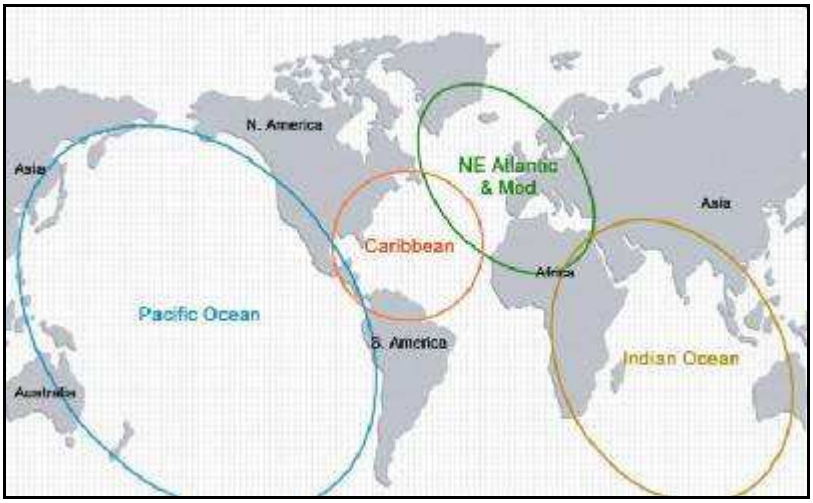

Fig. 9: Cooperation areas on tsunami warning system (source COI; UNESCO).

- **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*, a full capacity for coastal flooding forecast was first implemented at *Météo-France* in May 2017. This capacity was upgraded in September 2019 for storm surge forecasts. It now consists of :

- two nearshore wave forecasts chains (based on WaveWatch-III model), with a 200m-resolution unstructured grid around La Réunion and Mayotte islands, forced at open boundaries by the regional wave model MFWAM of *Météo-France*.
- a downscaling suite of 3 nested configurations (based on Shom's Hycom 2D barotropic model) with a 3km-resolution grid at regional scale down to 800m and 200m resolution around La Reunion and Mayotte islands respectively, including specific updated bathymetric DTM, to forecast storm surges and nearshore currents .

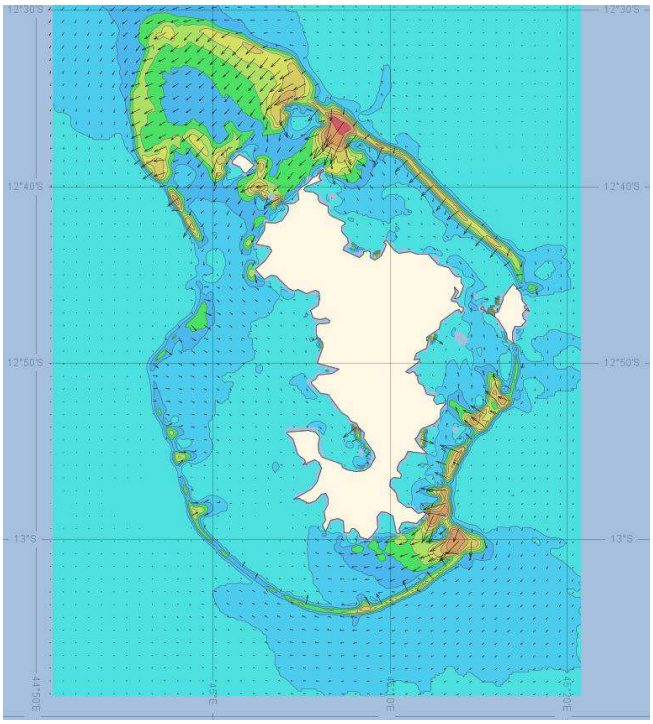

Fig. 10: Example of 24-hour forecast of 2D-barotropic currents on Sept. 10th 2019 00UTC around Mayotte Island. (source HOMONIM project. © Météo-France).

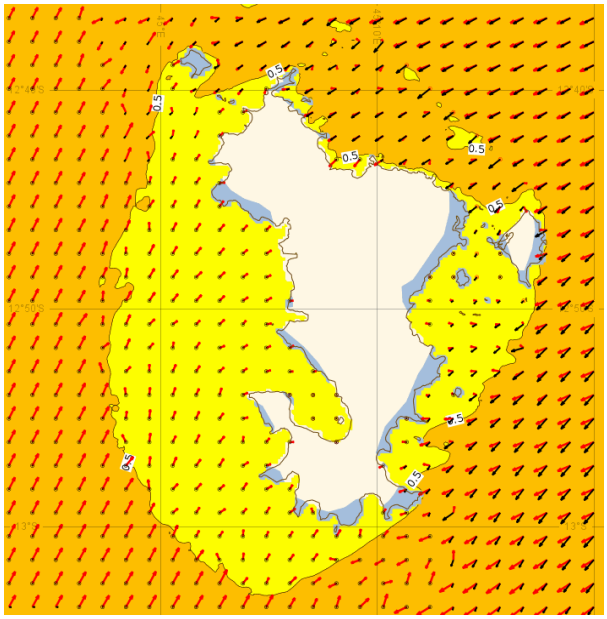

Fig. 11: Example of 36-hour forecast of full sea state height (shading) and direction (black arrows), and wind-driven waves direction (red arrows), on Nov 23rd 2017 00UTC around Mayotte island.(source HOMONIM project. © Météo-France).

- **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.

11.5. Environmental protection

NTR.

11.6. Engagement with the Maritime Administration

NTR.

11.7. Aids to Navigation matters

NTR.

11.8. Magnetic and gravity surveys

NTR.

11.9. International engagements

Within the SAIHC area, a bilateral arrangement of cooperation regarding hydrography, oceanography and nautical charting is concluded between France and the Union of Comoros (updated on November 11th 2019), 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).

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 (up to 250 NM) of La Reunion Island, Mayotte Island, Scattered Islands, Saint Paul and Amsterdam Islands, Crozet archipelago and Kerguelen Islands.

2. Operational Points of Contact for the National Coordinator

INSTITUTION	TELEPHONE	FACSIMILE	EMAIL
Shom, overseas office (dops-psm-na-om@shom.fr) of the "Information and Nautical publication" department of the "Maritime Products and services" division : na-om-all@shom.fr	+33 2 56 312 312 +33 2 56 312 273 +33 2 56 312 303	/	na-om-all@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 November 4th 2020).

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

Equipment Type for Ports and Local Area	Software Version	Date of Up-date
No NAVTEX station in French ovserseas territories within the SAIHC region. Coastal warnings broadcasted through SAFETYNET		
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
xx	xx.x Mins	xx	xx.x Mins	xx	xx.x Mins

4. NAVTEX Coverage:

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

Not applicable.

Coastal warnings broadcasted by SafetyNET in French overseas territories.

5. Operational Issues:

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

No comment.

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]

The mutual support process between NAVAREA II and VII coordinators was successfully tested in June 2018.

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, Régional 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?]

French overseas territories POCs for NAVAREA IV and XII:

AREA	COUNTRY	NAME	TELEPHONE	FACSIMILE
VII and VIII	French Areas (La Reunion, Mayotte, French Southern and Antarctic lands)	Commandant de Zone Maritime Sud Océan Indien	+262 (0)2 62 93 53 54	

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.]

Shom, as French national MSI coordinator, do not transmit MSI within the SAIHC region.

The role of the Shom is limited to the control and coordination of the warning issued by its national delegated coordinators.

Destinataire	**:**	**SAIHC17 Chair (UK) – OHI**
Copies intérieures	**:**	**DG – DMI – DMI/REX – GHOA – Archives (DMIDSD/2.009)**