SERVICE HYDROGRAPHIQUE
ET OCEANOGRAPHIQUE
DE LA MARINE

DIRECTION DES MISSIONS
INSTITUTIONNELLES ET DES
RELATIONS INTERNATIONALES

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FRENCH NATIONAL REPORT TO THE 9TH MEETING OF THE SOUTH AFRICA AND ISLANDS HYDROGRAPHIC COMMISSION MEETING

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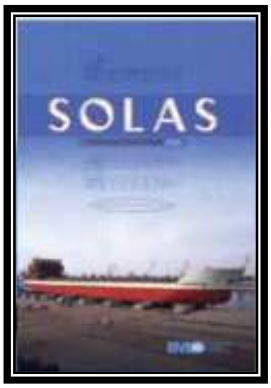
1. Hydrographic Service: General

SHOM, the French hydrographic service, is the heir of the first official hydrographic service in the world created in 1720. SHOM became a public service in 2007 with goals and budget set by a board of directors composed of representatives from various French ministries and organisations.



SHOM abides by the rules set for France by the International Maritime Organisation, and in particular by the SOLAS convention on safety of life at sea, specifying the obligation for coastal States to provide navigators with hydrographic services. SHOM is dedicated to guaranty the quality and the availability of information describing marine physical environment, along the coast and offshore, while coordinating its collection, filling and release. SHOM continuously ensures that public, civilian and military needs are satisfied at the lowest possible cost.

SHOM fulfils the missions of a national hydrographic service, supports defence and provides expertise to maritime policies. As a public service, SHOM can interact with other French geography, meteorology and oceanography specialists as well as with its European and international counterparts.

2. Surveys

2.1. Coverage of new surveys

SHOM has not conducted any new surveys in the SAIHC region since the last meeting; however, pending further approval from its board of directors, the deployment of an ocean survey vessel in the region is planned in the second semester of 2014 to conduct:

- surveys of French islands in the South Indian Ocean;
- surveys in the Union of the Comoros to update the original French charts;
- some additional surveys in Madagascar;
- and eventually, a survey en-route of a possible gap identified in the Western Indian Ocean Marine Highway.

Besides, SHOM has recently used spatial imagery to determine topographic data in the region of Toamasina (Madagascar) that will be used to update nautical chart (operation in progress).

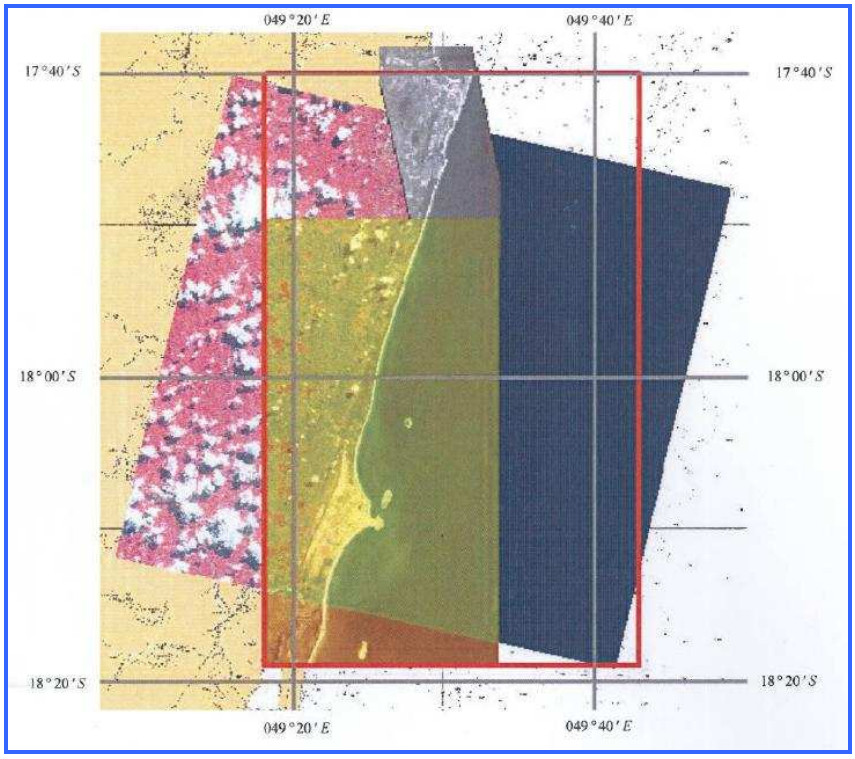


Fig. 1: topographic data determination in Toamasina (Madagascar) using Spot5 spatial imagery

2.2. Coverage of LIDAR surveys

LIDAR surveys have been conducted in 2009-2010, within the framework of Litto3D® program. This national program, laid on a partnership between SHOM and the French Geographic Institute (IGN), aims to provide a Sea-Land DTM of metropolitan and overseas French costs.

So far, the whole French overseas costs (Mayotte, Eparses islands and La Reunion) have been surveyed. The one conducted over the coasts of La Réunion has been delivered this month to its contractor, the Prefecture of La Réunion.

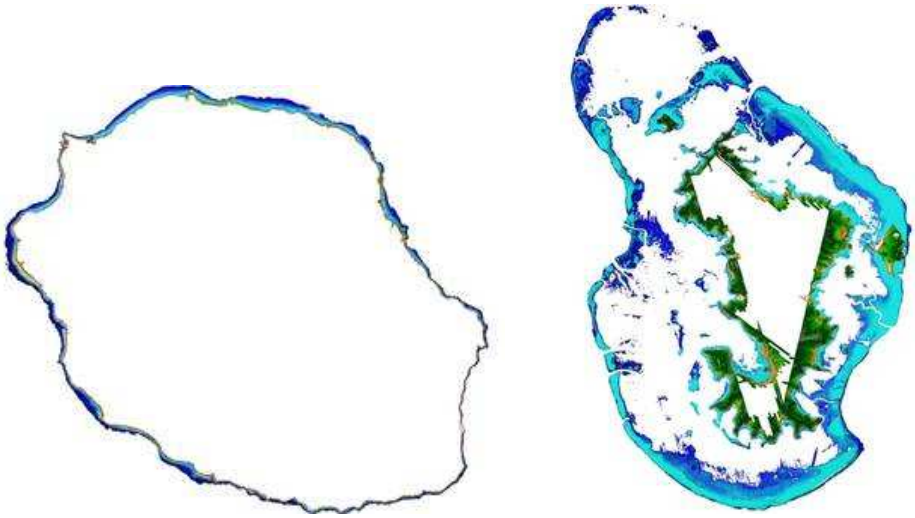


Fig.2: Litto3D® DTM coverage for La Réunion (left) and Mayotte (right) islands.

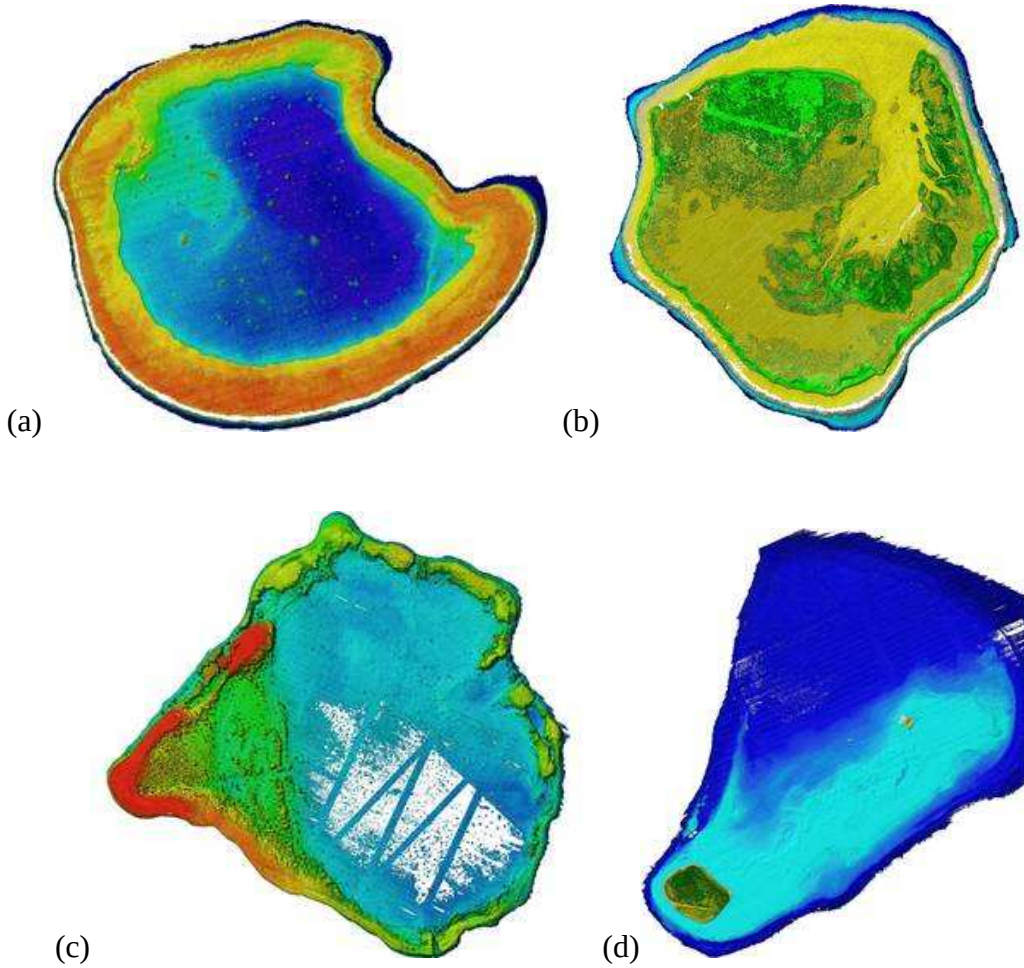
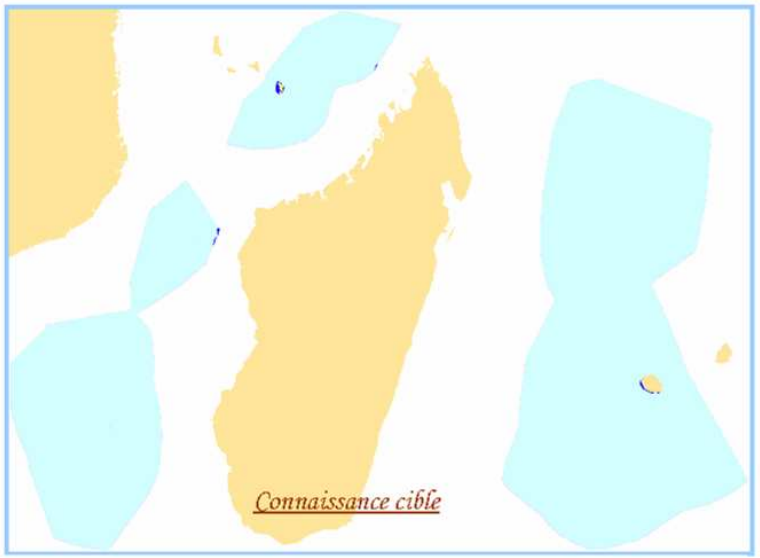


Fig.3: Litto3D® DTM coverage for four of Eparses islands: Bassas da India (a) and Europa (b), Geyser (c) and Glorieuses (d).

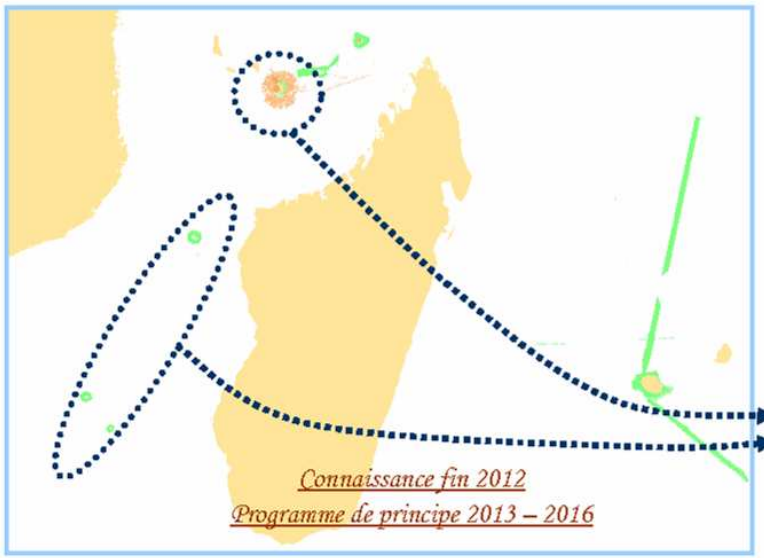
2.3. Survey program for the region

SHOM's survey program in French waters for the period 2013-2016 is described as below.
[Please note that LIDAR surveys (Litto 3D project) aren't taken account of]



La Réunion, Mayotte, îles Éparses

Répartition de la connaissance cible par ordre S-44 de l'OHI	Surface (km²)	Ordre spécial	Ordre 1a	Ordre 1b	Ordre 2
ZEE et extension juridique du plateau continental	1 090 370	/	/	0.1%	99.9%



Répartition de la superficie par niveau de qualité (%)	Levés réalisés après 1980. Qualité généralement conforme aux normes en vigueur	Levés réalisés entre 1950 et 1980. Qualité pouvant nécessiter des reprises partielles (*ordre 2 S-44*)	Levés réalisés avant 1950. Qualité insuffisante non-conforme aux normes en vigueur	Zone non connue
État connaissance fin 2012	2.5%	0.3%	0%	97.2%
État connaissance cible	*50.1%*	*0.2%*	*0%*	*49.7%*
État connaissance fin 2016	2.6%	0.3%	0%	97.1%

Programme de principe 2013 – 2016 :
- poursuite des levés à Mayotte (100 j) ;
- levés d'opportunité dans les îles du canal de Mozambique (20 j).

In accordance with this program, SHOM is actually planning a 10 months deployment of a survey ship in 2014.
Besides, if an agreement can be reached with SAMSA, acting on behalf of the World Bank, France would support the continuation of the WIOMH project, which phase 1 is to be terminated at the end of 2012 (report to section 7.2 for further details).

2.4. New technologies and /or equipment

In line with its policy of maximising the use of satellite, SHOM does not only focus on charting; it also invests in the safety of navigation and is currently testing the Low Rate Information System (LRIT) constellation, which should eventually replace the land-based Automatic Identification System (AIS).
Going back to satellite charting, SHOM has experimented a number of new constellations, both optical and radar. In parallel, it has also developed S-100 compatible satellite objects and layers with a view to produce "satellite-enhanced ENCs" when the time is ripe.

2.5. New ships

NTR.

2.6. Problems encountered

NTR.

3. New charts & updates

3.1. ENCs

On the 1st of August 2012, SHOM had produced some 357 ENCs at an approximate rate of 40 per year. The full collection should eventually reach a figure around 900 ENCs. In line with the WEND principles, France produces its small scale ENC cells as closely as possible to INT chart schemes. The French production plan is also compliant with IMO regulations on ECDIS mandatory carriage requirements.
The ENC coverage of all HSC lines in the SAIHC will fulfil SOLAS requirements in 2013 with the release of medium scale ENCs in the area. The delay in fulfilling those requirements is first due to the difficulty to transpose existing charts (due to their geodetic systems) and then to the late availability of recent surveys data and recent charts necessary to produce ENCs. On the other hand, Mutsamudu harbour (Anjouan) access will be covered with a large scale chart scheduled in 2014-2015
The SHOM ENC coverage of the SAIHC area is depicted in the chartlets hereafter.

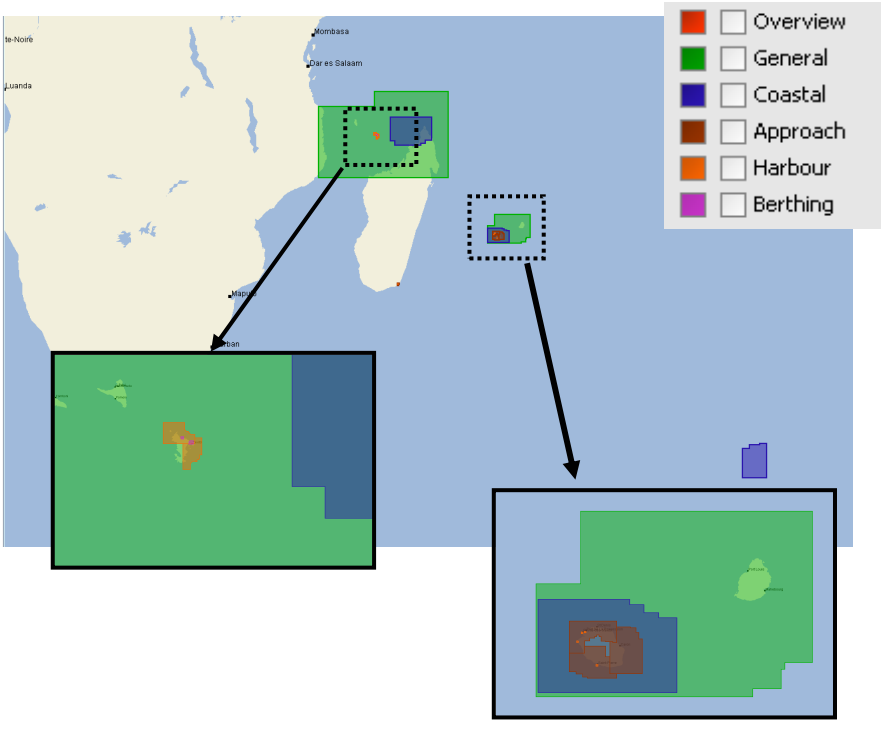


Fig.4: SAIHC's French ENC coverage.

The status of ENC production in the area is:

Usage Band	Produced Cells	Planned Cells	%
1	0	0	/
2	2	5	40,00%
3	2	3	66,67%
4	4	8	50,00%
5 and 6	9	17	53,00%
Total	17	33	51,51%

Chart production since the last conference:

N°	New chart (NC) or new edition (NE)	Title
FR56054A	NC	*Madagascar - Fort Dauphin*
FR460540	NC	*Madagascar - Baie de Fort Dauphin et accès au port d'Ehoala*
FR57183A	NE	*Ile de La Réunion - Port de Saint-Gilles les Bains. Replaces FR532030*
FR57183B	NE	*Ile de La Réunion - Port Réunion (Pointe des Galets) - Port ouest. Replaces FR532010*
FR57183C	NE	*Ile de La Réunion - Port Réunion (Pointe des Galets) - Port est. Replaces FR532020*
FR471830	NE	*Ile de La Réunion - partie Nord. Replaces FR4732010*
FR67493A	NE	*Ile de Mayotte - Dzaoudzi*
FR574930	NE	*Ile de Mayotte - partie Est*
FR67492A	NC	*Ile de Mayotte - Baie de Longoni*

Publications planned in 2012 (second semester):

N°	New chart (NC) or new edition (NE)	Title
FR574920	NE	*Ile de Mayotte - partie Nord*
FR473280	NE	*Ile de La Réunion - partie Sud*

New publications planned in 2013-2014:

Area	Usage Band	FR paper chart Nr	Observations
Anjouan – Grande Comore – Mohéli	4	7678, 7679 (new charts are planned)	High speed crafts
Madagascar - Antsiranana	5	7680 (new paper chart)	/
Madagascar - Antsiranana	6	7681 (new paper chart)	/
Madagascar - Toamasina	5	7683 (new paper charts)	/
Île de Mayotte	3	7677 (new paper chart)	/
Anjouan – Grande Comore – Mohéli	5	7495 (new paper chart)	/

3.2. ENC Distribution method

All French ENCs are distributed to End User Service Providers by PRIMAR RENC. FR is providing its support to the IC-ENC-PRIMAR Cooperation Committee working groups to develop a RENC-to-RENC cooperation concept.

3.3. RNCs

NTR.

3.4. INT charts

[Report to next section for further details]

A scheme at medium scale will be studied around Madagascar to cover the approaches of the island and to fill the gap between the large scale charts and the general coverage at 1:1 million scale. This new scheme will be sent to the SAIHC coordinator when ready.

The status of INT chart production for this area is:

Scale	Produced INT charts	Planned INT charts	%
Small (<1/1 000 000)	1	4	25,00%
Medium	3	7	43,00%
Large (>1/100 000)	1	3	33,00%
Total	5	14	36,00%

3.5. National paper charts

Production since the last SAIHC meeting:

N° Nat.	N° INT	New chart (NC) or new edition (NE)	Scale 1:	Date	Title
6664	700	NE	3 300 000	Dec. 2011	*De Port Elisabeth à Maurice (Mauritius) (Facsimile of ZA28)*
6672	701	NE	3 700 000	Aug. 2011	*De Maputo à Mogadiscio (Muqdisho) - Madagascar (Madagasikara) (Facsimile of GB4701)*
6673	702	NE	3 700 000	Aug. 2011	*De Chagos Archipelago à Madagascar (Madagasikara) (Facsimile of GB4702)*
7183	7736	NE	60 000	Dec. 2011	*La Réunion - Partie Nord - De la Pointe des Châteaux à la Pointe de la Rivière du Mât*
7328		NE	60 000	July 2012	*La Réunion - Partie Sud - De la Pointe des Châteaux à la Pointe Marcellin*
7492		NE	35 000	Jan. 2012	*Île de Mayotte - Partie Nord - De la Passe des Îles Choazil à Dzaoudzi*
7493		NE	35 000	Jan. 2012	*Île de Mayotte - Partie Est - De Dzaoudzi à la Pointe Sazilé*

Planned in 2012 (second semester):

N° Nat.	N° INT	New chart (NC) or new edition (NE)	Scale 1:	Title
7165	7737	NC	125 000	*Île Maurice (Facsimile of GB711)*
7678		NC	156 000	*Anjouan/Mohéli (Comoros Islands) - Replaces FR6238*
7679		NC	156 000	*Comores/Mohéli (Comoros Islands) - Replaces FR6239*
7681		NC	15 000	*Baie de Diego Suarez – Baie des Français – Port de la Nièvre – Port d'Antsiranana - Replaces FR 4697 (Madagascar)*
7683	7723	NC	15 000	*Mouillages et passes de Tamatave – Replaces FR6150 and FR6527 (Madagascar)*

Planned in 2013-2014:

N° Nat.	N° INT	New chart (NC) or new edition (NE)	Scale 1:	Title
TBD		NC	TBD	*Port de Mahajanga (Madagascar) –*
TBD		NC	TBD	*Approches de Mahajanga (Madagascar) –*

7490	7710	NC	350 000	*Des Comores au récif du Geyser.* *(Replaces FR5983)*
7495		NC	Div.	*Ports et mouillages de l'Archipel des Comores – Replaces FR4806 and FR3698*
7677		NC	156 000	*Mayotte - Replaces FR6237.*
7680		NC	40 000	*Baie de Diego Suarez - Replaces FR 4696 (Madagascar)*
7682	7722	NC	50 000	*Abords nord de Tamatave – Replaces FR6318 (Madagascar)*

(*) France woks on a cartographic project for the area of Mahajanga (Madagascar). We will send the proposal to the region H ICCWG coordinator.

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

NTR.

3.7. Problems encountered

As many other IHO member states, France is responsible for collecting nautical information and surveying areas that would otherwise remain uncharted. It happens from time to time that SHOM only learns by accident of surveys performed by private companies, or even other hydrographic offices, in its areas of charting responsibility, and has to insist to obtain communication of IHO-compliant data relevant to INT charts and nautical information.

In the interest of the international maritime community, it is reminded that survey results should be automatically communicated to the IHO recognised and primary charting authority (in accordance with M-3 resolution 1/2006 and S-4 resolution A-402.1 and B-635.4).

In addition, provision should be made in all contracts awarded to private survey companies to the effect that hydrographic data pertinent to the safety of navigation be communicated to the IHO recognised charting authority.

4. New publications & updates

4.1. New Publications

Type	N°	Title
IN	L9	NtM Indian Ocean Islands (Southern part) - *Terre Adélie* (2012)
LL	LC	Atlantic Ocean (East) - Indian Ocean (West) - Pacific Ocean (2011)
RSX	922	Maritime radio communications - Volume 2 : Africa – Asia – Australasia (2011)
RSX	93	Radio communications for maritime traffic monitoring and piloting (2012)
DIV	115	Tide table 2011 - Volume 2 - Overseas ports
DIV	125	Tide table 2011 - Volume 2 - Overseas ports

IN : Sailing directions
RSX : Radio stations
LL : List of Lights
DIV : Miscellaneous

4.2. Updated publications

Correction list number 1 to L8 IN "Africa (East Coast)".

4.3. Means of delivery
NTR.

4.4. Problems encountered
NTR.

5. MSI Existing infrastructure for transmission

5.1. New infrastructure in accordance with GMDSS Master Plan
NTR.

5.2. Problems encountered
NTR.

6. C-55 Latest update
The C-55 database for French areas of responsibilities is regularly updated by SHOM. Separate entries are now available for French areas in each IHO region.

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

7.1. Training received, needed, offered
NTR.

7.2. Status of national, bilateral, multilateral or regional development projects with hydrographic component
Following the positive experience of the *St. Lawrence Marine Electronic Highway* (1990), made possible through the latest technological developments (ECDIS, e-Navigation, AIS, etc.), the World Bank and the international maritime organisations (IMO, IHO, IALA) have established two test projects of Marine Highways (MH) in the Malacca and the Mozambique Straits. Regarding to the Mozambique Strait project (WIOMHP), the first phase of the project, supposed to end this year, has shown significant progress since the last conference. Unfortunately, the approval of this Marine Highway has been postponed until next year by the IMO, following a complaint raised by the International Chamber of Shipping (ICS) during the last NAV58 July conference.

In spite of that, the phase 2 of the project, regarding a North-Eastward extension, is still considered as relevant.

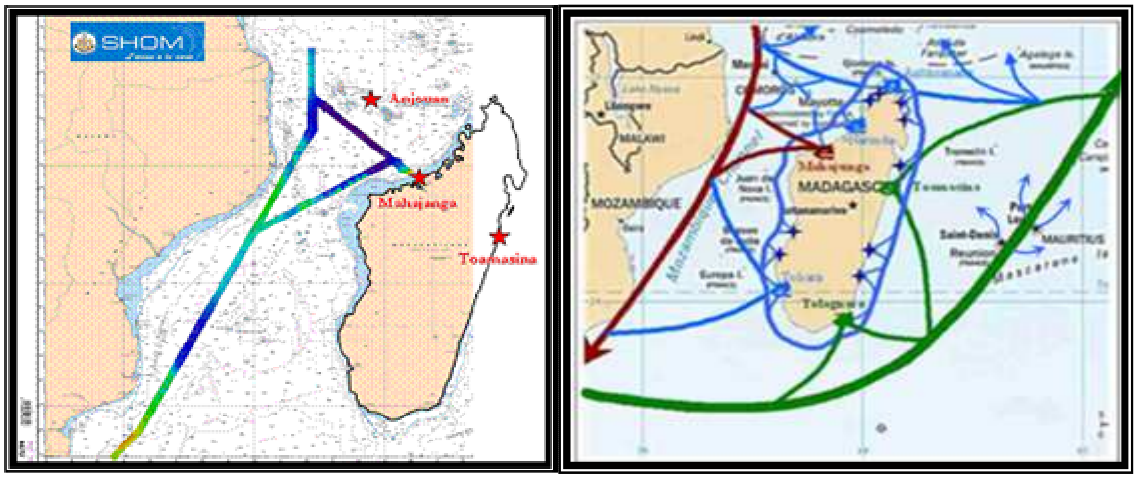


Fig.5: WIOMHP Phases 1 (left) and 2 (right) overview.

In the event of a WIOMHP phase 2, efforts will aim at developing satellite derived charting in addition to proper surveys. From its 20 year experience, SHOM came to the

conclusion that satellite charting, combining radar and optical satellites and limited ground truth, is the only expedient way to cover very large stretches of coastlines and archipelagos and meet countries' Integrated Coastal Management requirements.

The adjournment of the WIOMHP submission at the IMO has shown the lack of interest from international commercial shipping for improvement of regional hydrography.

However, the improvement of regional hydrography remains a key to local economical growth, particularly in that region.

7.3. Definition of bids to IHOCBC

In accordance with the CBSC work programme 2011, SHOM conducted a follow-up technical visit to Madagascar and Comoros early July 2011. The reports, issued at the end of 2011, have emphasized the use of satellite techniques that could lead to the build-up of a chart production capacity in those regions in order to complete efficiently surveys in those areas.

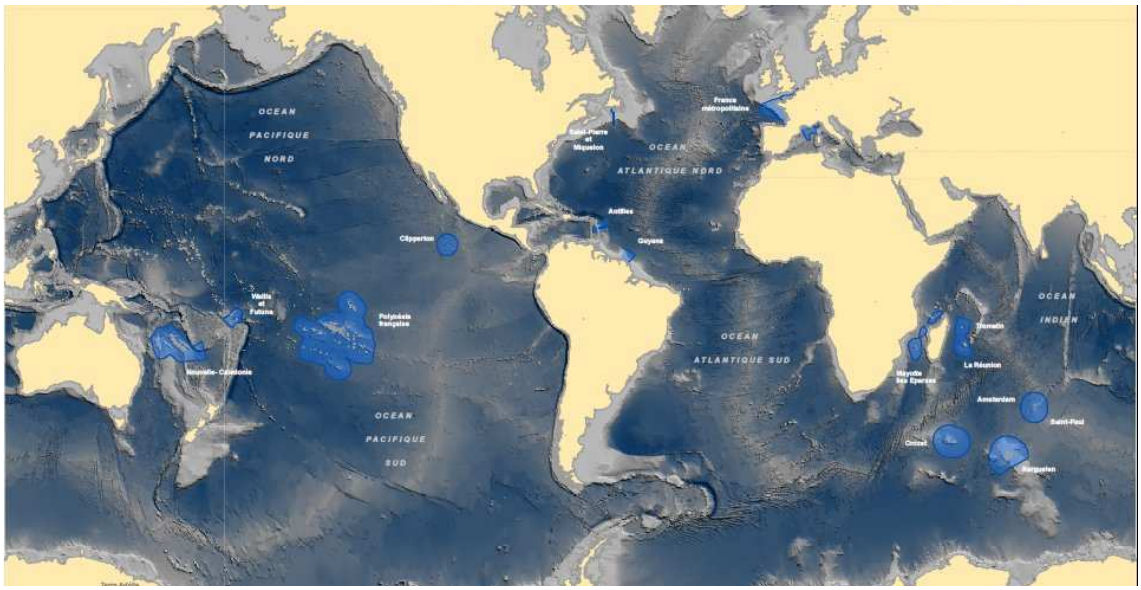
8. Oceanographic activities

8.1. GEBCO/IBC's activities

NTR.

8.2. Tide gauge network

Since 2010, SHOM is officially the French national coordinator and reference authority in the field relating to the observation of the sea level and the management and issue of the resulting data. Since then, these missions are carried out under the REFMAR programme. Real time and processed tide gauge measurements are now accessible on the website www.refmar.fr in all areas around the world under French jurisdiction as shown hereunder:



<u>Fig.6:</u> French jurisdiction waters

A new bilingual web portal is operational since November 2011. From it, people can download measurements from REFMAR service, after registration. SHOM is working to make available not only its observations (RONIM network) but also the ones of all the others data producers (Port authorities, universities, scientific institutes, ...) while preserving their visibility and the traceability.

November 2011, in collaboration with Météo France, a new real time tide gauge has been installed in Sainte-Marie located on the North-Eastern coast of La Reunion Island,

in order to help tsunami warning in the Indian Ocean. The data is transmitted in real time through Global Telecommunication System (GTS).

Fig.7: Installation of the tide Gauge of Sainte-Marie (La Réunion Island) for Tsunami warning.

The tide gauge of Toamasina (Madagascar) that was installed by France in 2010 was presented to UNESCO/GLOSS Committee on Mean Sea Level Observation that was held in November 2011. In the long term, the station could be integrated to the GLOSS core Network as its location fits with the lack of data on Madagascar coast.

8.3. New equipment
NTR.

8.4. Problems encountered
NTR.

9. Other activities

9.1. Meteorological data collection
NTR.

9.2. Geospatial studies
NTR.

9.3. Disaster prevention
SHOM tide gauge network (RONIM) contributes to tsunami warning in North-Eastern Atlantic Ocean, Western Mediterranean sea, Caribbean sea, Pacific Ocean and Indian Ocean. Installing real time permanent stations and upgrading the others with real-time transmission is recognised as a key component for the development of tsunami warning systems. Indeed, the real time sea level observations allow, in case of a seismic event, to detect the tsunami wave and measure its characteristics (Time of arrival, height,

wavelength …). Later, they will also be useful for the validation of wave propagation models.
On the same way, the RONIM network (SHOM) contributes to the storm surge warning program that was launched in October 2011 by Météo France. It aims to prevent people from floods generated by the rise of sea level in case of a strong storm coming to the coast. Sea level observations on long periods are also necessary to compute relevant high water level thresholds.

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 disaster is Cdr Bertrand Menanteau. His division can be reached 24/7 by fax +33 298 221 665 or email coord.navarea2@shom.fr

9.4. Environmental protection

SHOM provides expertise and operational support to national civil security projects relative to integrated coastal management and is also part of the *CECILE* project on coastal environmental changes and the impact of sea level rise.

SHOM also works together with several entities responsible for setting the national marine environmental strategy by participating to the operational research and innovation committee of the *Grenelle de la Mer* and contributing to the national environmental alliance *AllEnvi*.

As an example, SONEL project dedicated to the observation of the sea level rise was recognized by the French government as it has been identified as a major action of the National Plan for adaptation to the climate changes (PNACC).

9.5. Astronomical observations

NTR.

9.6. Magnetic/Gravity surveys

NTR.

9.7. MSDI Progress

One of the best ways to raise awareness with regards to MSDI amongst IHO Observers, Associate Member States, and even Member States representatives, would be to invite them to participate in a MSDI workshop organized back-to-back with the RHC conference, provided their expenses (flights, accommodation, visa, etc.) are funded by sponsors such as the CBSC fund.
An MSDI workshop would allow reaching other categories of stakeholders than IHO traditional focal points. However, the selection of attendees might then be complicated considering the relationships between different organizations in developing countries and especially those who do not have a National Hydrographic Committee.
Furthermore, it is important to make sure that capacity building in MSDI can fit the current CBSC strategy (Phase 1, 2 and 3), while keeping in mind that support to safety of navigation is the IHO primary responsibility.
To fulfil its responsibilities, SHOM currently operates an assortment of heterogeneous systems to stock, manage and exploit collected hydrographic data (navigational aid, soundings, tidal components…). The INFRAGEOS-H® project aims at procuring an

interoperable database management system, providing better access to optimised geo-referenced databases and improving information processing.
This next-generation set of tools will allow SHOM to tackle the ever-changing information and product requirements, such as new 3D developments. It also enables SHOM to comply with international normalization standards and data dissemination policies such as the INSPIRE European directive or the regulation set by the IHO. INFRAGEOS-H® paves the way to an all-inclusive system.
The results achieved with the hydrographic component will be capitalized and enhanced. The Geospatial Infrastructure covering all themes is as shown on the following diagram:

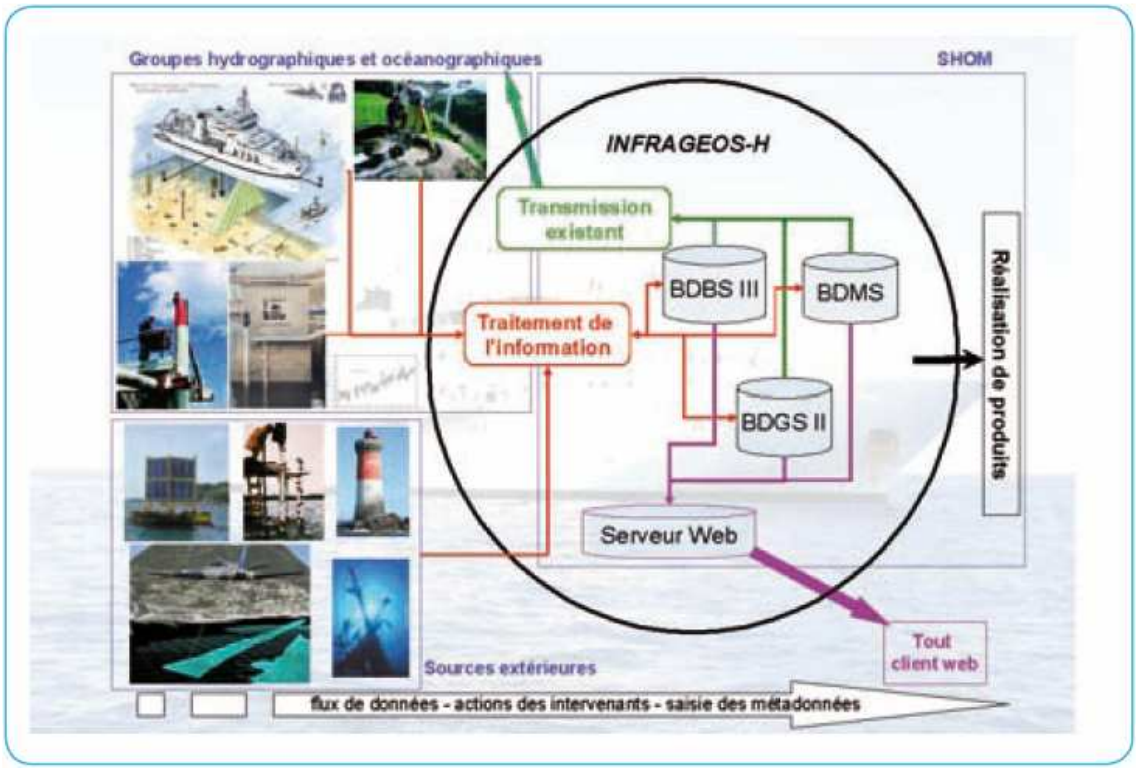


Fig.8: INFRAGEOS-H ®project infrastructure

9.8. International

Because of its overseas territories and primary charting responsibilities, France, represented by SHOM, is a full member or an observer in 9 commissions amongst the 15 organized by the IHO. Indeed, in 2012, France appliance to become associate member of the ROPME Sea Area Hydrographic Commission has been accepted.
Besides, Mr. Gilles Bessero, former SHOM director general, has been elected to the Directing Committee to the International Hydrography Organization at the 18th International Hydrographic Conference that was held in Monaco in April 2012.
The detail of SHOM's involvement in IHO activities is listed in the table hereafter:

Name	Chair / Vice chair	Member	Observations
CBSC		✓	Capacity Building Sub-Committee
CSPCWG		✓	Chart Standardisation and Paper Chart Working Group
DIPWG		✓	Digital Information Portrayal Working Group, former CSMWH
DPSWG		✓	Data Protection Scheme Working Group
DQWG		✓	Data Quality Working Group -Last meeting in 1996

EAtHC		✓	Eastern Atlantic Hydrographic Commission.
EUWG	✓	✓	ENC Updating Working Group
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)
IRCC		✓	Inter-Regional Coordination Committee
LAWG		✓	Legal Advisory Working
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
NSHC		✓	North Sea Hydrographic Commission
SAIHC		✓	Southern Africa and Islands Hydrographic Commission
SNPWG		✓	Standardisation of Nautical Publications Working Group
SWPHC		✓	South-West Pacific Hydrographic Commission
TSMAD		✓	Transfer Standard Maintenance and Application Development
TWLWG	✓	✓	Tidal and Water Level Working Group
WEND		✓	Wold-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)

For the many countries benefiting from French support to meet the hydrographic services requirements spelled out by the SOLAS convention, France has implemented 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.

10. Conclusions

Although this region has benefited from a structured cooperation between hydrographic services in order to ensure mariners' safety world wide, the failure to approve the WIOMH by the IMO has jeopardized the funding of hydrographic orientated initiatives in the region.

However, the perspective of developing satellite derived charting might contribute to countries development: first, it will reduce significantly uncharted coastal areas, leaving sea surveys focused on navigation safety purposes in areas of interest. And it also can become a vector for the local economy.