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SERVICE HYDROGRAPHIQUE  
ET OcéANOGRAPHIQUE  
DE LA MARINE

DIRECTION DES MISSIONS  
INSTITUTIONNELLES ET DES  
RELATIONS INTERNATIONALES

Dossier suivi par  
IPETA Eric Langlois  
*Head of the external relations division*  
Tel : +33 1 53 66 97 81  
Fax : +33 1 41 74 94 23  
Mél : [eric.langlois@shom.fr](mailto:eric.langlois@shom.fr)

**FRANCE NATIONAL REPORT  
TO THE 13<sup>TH</sup> CONFERENCE OF THE SOUTH AFRICA AND ISLANDS  
HYDROGRAPHIC COMMISSION**

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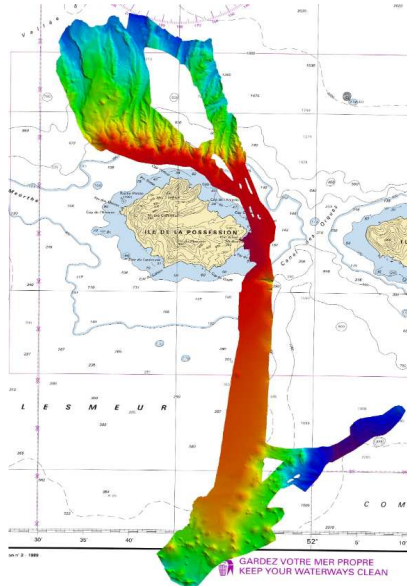
**1. Hydrographic Service: General**

Following up its targets and performance contract for the 2013-2016 period, SHOM is pursuing the achievement of its different commitments based on the National Maritime Strategy and Defence Policy. Survey works are being conducted according to the prioritized 4-years survey plan for all the waters under French jurisdiction. A new 4 years plan will be submitted to SHOM's board and to French authorities at the end of 2016.

**2. Surveys**

**2.1. Coverage of new surveys**

No survey has been performed by the SHOM in the area since the last conference. MARION DUFRESNE 2, operated by the *Institut Paul-Emile Victor* (French Polar Institute) achieved a survey in the vicinity of Ile de la Possession (Archipel des Crozet) in the beginning of 2016.



*Fig.1: Survey work in Crozet Archipelago, near Ile de la Possession.*

## 2.2. LIDAR Surveys

LIDAR surveys are achieved within the framework of Litto3D® program. This national programme, based on a partnership between SHOM and the National Geographic Institute (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. Every Litto3D products issued are freely downloadable from SHOM's data portal ([data.shom.fr](http://data.shom.fr)) and from the French Government open platform for public data ([data.gouv.fr](http://data.gouv.fr)).

## 2.3. French Survey programme for the region

Hydrographic vessel *Beautemps-Beaupré* will be deployed in the Indian Ocean in 2017. Surveys are scheduled in Mayotte and, subject to the agreement of Madagascar authorities, in ports of the south of Madagascar.

## 2.4. New technologies and /or equipment

NTR.

## 2.5. New ships

NTR.

## 2.6. Problems encountered

NTR.

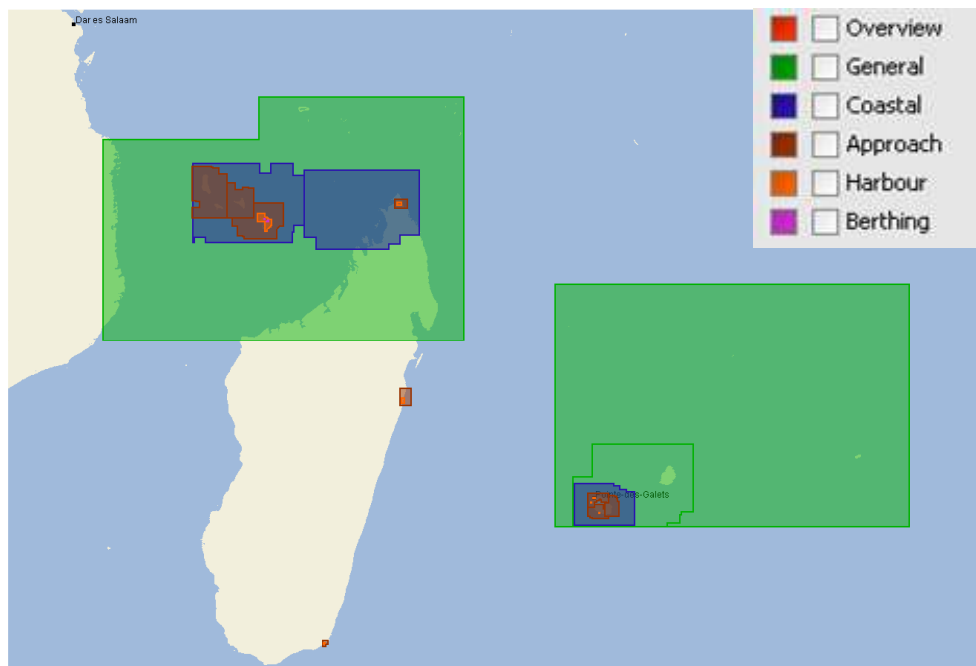
## 3. New charts & updates

### 3.1. ENCs

On the 21<sup>st</sup> of June 2016, SHOM had produced 509 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.

At small and medium scales, the ENC coverage of all vessels categories concerned by mandatory ECDIS carriage rules up to July 2016 in the SAIHC region fulfils SOLAS requirements. The SHOM ENC coverage of the SAIHC area is depicted in the chartlets hereafter.



*Fig.2: SHOM's ENC production within Region H.*

No ENC's were produced since the last conference. Hereafter are the ENC's planned for 2016-2018:

Number	Scale 1:	Title	Comment
FR277970	700 000	<i>Partie Nord du Canal du Mozambique</i>	INT 7054 Ought to replace part of PT281101
FR277980	700 000	<i>Partie Sud du Canal du Mozambique</i>	INT 7053 Ought to replace part of PT281101
FR476840	45 000	<i>Approches de Mahajanga</i>	INT 7724 Ought to replace GB400701
FR576850	8 000	<i>Ports de Mahajanga et de Boanamary</i>	INT 7725
FR274890	700 000	<i>Approches Sud-Est de Madagascar</i>	INT 7064 Ought to replace GB200760
FR274870	700 000	<i>Approches Nord-Est de Madagascar</i>	INT7062 Ought to replace GB200759
FR57495A	12 000	<i>Anjouan – Mouillages de Moutsamoudou et d'Ouani</i>	
FR67495B	4 000	<i>Anjouan – Appontement pétrolier d'Ouani</i>	
FR67495C	4 000	<i>Anjouan – Port de Moutsamoudou</i>	
FR57495D	12 000	<i>Anjouan – Mouillages de Bambao et de Domoni</i>	
FR57495E	12 000	<i>Mohéli – Mouillage de Fomboni</i>	

FR57495F	8 000	<i>Grande Comore – Mouillage de Moroni</i>	
FR373500	90 000	<i>Récif du Geysier – Banc de la Zélée</i>	
FR574940	22 000	<i>Ile de Mayotte – Partie Ouest, De Chissioua Mbouini à la baie d’Acoua</i>	
FR57349A	22 000	<i>Ile Tromelin</i>	
FR464970	45 000	<i>Ile de la Possession – Île de l’Est</i>	
FR56497A	8 000	<i>Ile de la Possession – Baie du Marin – Port Alfred</i>	
FR364980	180 000	<i>Iles Crozet</i>	Related to INT 7747
FR46498A	45 000	<i>Ile aux Cochons – côte Est, mouillage de la Meurthe</i>	Related to INT 7747
FR473580	22 000	<i>Iles Kerguelen – Golfe du Morbihan – Partie Est</i>	
FR47358A	22 000	<i>Baie Greenland</i>	
FR473590	22 000	<i>Iles Kerguelen – Golfe du Morbihan (partie Ouest)</i>	
FR57359A	8 000	<i>Pointe Molloy</i>	
FR57359B	8 000	<i>Port-aux-Français</i>	
FR47170A	22 000	<i>Ile Saint-Paul</i>	
FR47170B	22 000	<i>Ile Amsterdam</i>	
FR57170C	12 000	<i>Mouillage de l’île Saint-Paul</i>	

The status of ENC production in the area is:

Usage Band	Produced Cells	Planned Cells	%
2	3	7	42,8
3	3	5	60
4	9	17	53
5	9	24	46
6	2		
<b>Total</b>	26	53	49

### 3.2. ENC Distribution method

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

Since 2014, SHOM provides georeferenced marine charts in GeoTiff and S-57 format when produced. These digital marine charts are now available through SHOM’s online store <http://diffusion.shom.fr> under various licences<sup>1</sup> according to the purpose of use. These data can be used with GIS or cartographic software for commercial or private purposes.

<sup>1</sup> Internal reuse, commercial reuse, documentary use or end user

A S-57 license<sup>2</sup> allows unlimited download of updated versions for 12 months from the date of purchase.

### 3.3. RNCs

NTR.

### 3.4. INT charts

See next section for details.

French charts now include a QR Code to direct access to NTM applicable to that chart. Moreover, all up to date French charts are now available by 'Print On Demand' to French forces users.

The overall planning of SHOM for INT charts production in the region is as follows:

Scale	Produced INT charts	Planned INT charts	%
<b>Small (&lt;1/1 000 000)</b>	2	6	33
<b>Medium</b>	4	7	57
<b>Large (&gt;1/100 000)</b>	3	<b>5</b>	<b>60</b>
<b>Total</b>	9	<b>18</b>	<b>50</b>

Regarding printer nation responsibilities, France request to the Indian Hydrographic Office to become a printer nation of the INT7739 (IN2514), covering Port Louis and its approaches, is still pending.

### 3.5. National paper charts

No charts were produced since the last Conference.

Besides, the following charts are planned for the 2016-2018 period:

National	INT	New chart (NC) or new edition (NE)	Scale 1:	Title
7685	7725	NC	10 000	Ports de Mahajanga et de Boanamary (Madagascar) <i>Replaces FR6078</i>
7684	7724	NC	50 000	Approches de Mahajanga (Madagascar) <i>Replaces FR6077</i>
7487	7062	NC	1 000 000	Approches Nord-Est de Madagascar
7489	7064	NC	1 000 000	Approches Sud-Est de Madagascar
7495	/	NC	Div.	Ports et mouillages de l' Archipel des Comores <i>Replaces FR4806 and FR3698</i>
7797	7054	NC	1 000 000	Partie Nord du Canal du Mozambique
7798	7053	NC	1 000 000	Partie Sud du Canal du Mozambique

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

<sup>2</sup> Each licence allows internal reuse of the data for up to 5 workstations. For more information, contact [bp@shom.fr](mailto:bp@shom.fr).

NTR.

### 3.7. Problems encountered

NTR.

## 4. New publications & updates

### 4.1. New Publications

Since the last conference, the following publications relevant for the region have been issued:

Type	Title
L	LC--FNA : Océan Atlantique (Est) – Océan Indien (Ouest) – Océan Pacifique – Edition 2016
RSX	922-RNA : Radiocommunications maritimes – Volume 2 : Afrique – Asie – Australasie – Edition 2015
RSX	962-RNA : Stations radiométéorologiques – Volume 2 : Europe – Afrique – Asie – Edition 2015

RSX: Radio stations; L: List of Lights

### 4.2. Updated publications

NTR.

### 4.3. Means of delivery

At the beginning of 2016, 85 % of nautical publications were available in digital format on SHOM's online store (diffusion.shom.fr). Regarding that region, all publications are available in digital format, excepted the L8 nautical instructions, scheduled for 2016.

### 4.4. Problems encountered

NTR.

## 5. MSI Existing infrastructure for transmission

Besides, since January 1st 2014, SHOM's notices to mariners (GAN) are exclusively available under digital formats, either downloadable on shom.fr or by annual subscription (CD-rom).

### 5.1. 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.

### 5.2. Problems encountered

NTR.

## 6. C-55 update

The last C-55 update by France has been transmitted to the IHB on August 28<sup>th</sup> 2015. The C-55 charting and surveying status values regarding Region H areas under SHOM responsibility are summed up in the following tables:

Survey Status	Depth < 200m			Depth > 200m		
	A	B	C	A	B	C
Îles Éparses - France (Bassas de India, Europa et Juan de Nova)	100	0	0	15	16	69

Mayotte et Glorieuses – France	70	20	10	51	0	49
La Réunion et Tromelin – France	40	30	30	19	1	80
Terres Australes françaises (Crozet, Kerguelen, Amsterdam, Saint-Paul)	6	0	94	20	15	66
Comores (Union des)	36	0	64	28	0	72
Madagascar (République de)	1	0	99	12	0	88

Charting Status	Small (<1 M)			Medium (1M < / < 100 000)			Large (> 100 000)			Metric	WGS84
	A	B	C	A	B	C	A	B	C		
Iles éparses - France (Bassas de India, Europa et Juan de Nova)	100	0	NA	0	0	0	0	0	0	100	100
Mayotte et Glorieuses – France	100	0	100	100	0	100	75	0	50	100	100
La Réunion et Tromelin – France	100	0	NA	100	0	100	100	0	75	100	100
Terres Australes françaises (Crozet, Kerguelen, Amsterdam, Saint-Paul)	100	0	NA	100	0	33,33	56	0	0	100	100
Comores (Union des)	100	0	100	100	0	100	20	0	0	100	100
Madagascar (République de)	100	0	33,33	10	0	7,69	40	0	33,3	100	100

Fig. 3: C-55 values for survey status (top table) and charting status (down table). Updated values are highlighted.

## 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-IHO-ACI courses: category A & B for hydrographic surveyors and category B for nautical cartographers. So far, those courses are provided in French language and are open to francophone foreign applicants.

**SHOM**  
L'océan à la carte

## TRAINING COURSES PROVIDED BY SHOM SCHOOL

**BS HYDRO<sup>B</sup>**

- Average number of students: 8 petty officers / 2 foreign military officers
- Duration: 14 months
- Admission: based on application file
- Curriculum:
  - manoeuver and navigation Training
  - specific course on hydrography and oceanography
  - on board end-study project

**C SYSRES-HOM**

- Average number of students: 3 to 5 hydrographers petty officers
- Duration: 9 months
- Admission: based on application file
- Curriculum:
  - information technology theoretical and practical training (application to hydrography IT)
  - Practical internships in SHOM IT department and survey unit (GHOA)

**C SUP HYDRO**

- Average number of students: 2 to 5 hydrographers petty officers
- Duration: 3 months
- Admission: based on application file
- Curriculum:
  - advanced technical training on hydrography
  - team management training

**NAUTICAL CARTOGRAPHER TRAINING COURSE<sup>B</sup>**

- Average number of students: 1 to 8 trainees
- Duration: 9 months
- Admission: based on diplomas or competitive exam
- Curriculum:
  - general training on hydrography and geosciences
  - specific training on nautical cartography
  - end-study technical project

**SHOM school support to ENSTA Bretagne<sup>B</sup>**

- Average number of students: 2 French military engineers and 20 civil students
- Duration: 36 months (+12 months for French military students)
- Admission: based on diplomas or competitive exam
- Curriculum: see [www.ensta-bretagne.fr](http://www.ensta-bretagne.fr)

**HYDROGRAPHIC ENGINEER**

- Average number of students: 5 French or foreign civilian students
- Duration: 24 months
- Admission: based on diplomas
- Curriculum: see [www.ensta-bretagne.fr](http://www.ensta-bretagne.fr)

**MASTER ON HYDROGRAPHY**

Le Centre - ENSTA - Ecole Nationale Supérieure des Techniques Avancées - FR 02043 - Plateau de Mûrs - 35170 Lannion - Département d'Hydrographie - Académie de la Cartographie (catégorie A)  
 Plateau de Mûrs - 35170 Lannion - FR 02043 - Plateau de Mûrs - 35170 Lannion - Département d'Hydrographie - Académie de la Cartographie (catégorie B)  
 Plateau de Mûrs - 35170 Lannion - FR 02043 - Plateau de Mûrs - 35170 Lannion - Département d'Hydrographie - Académie de la Cartographie (catégorie C)  
 Plateau de Mûrs - 35170 Lannion - FR 02043 - Plateau de Mûrs - 35170 Lannion - Département d'Hydrographie - Académie de la Cartographie (catégorie D)  
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 Plateau de Mûrs - 35170 Lannion - FR 02043 - Plateau de Mûrs - 35170 Lannion - Département d'Hydrographie - Académie de la Cartographie (catégorie F)  
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 Plateau de Mûrs - 35170 Lannion - FR 02043 - Plateau de Mûrs - 35170 Lannion - Département d'Hydrographie - Académie de la Cartographie (catégorie Y)  
 Plateau de Mûrs - 35170 Lannion - FR 02043 - Plateau de Mûrs - 35170 Lannion - Département d'Hydrographie - Académie de la Cartographie (catégorie Z)

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.

### 7.3. Definition of bids to IHOCBC

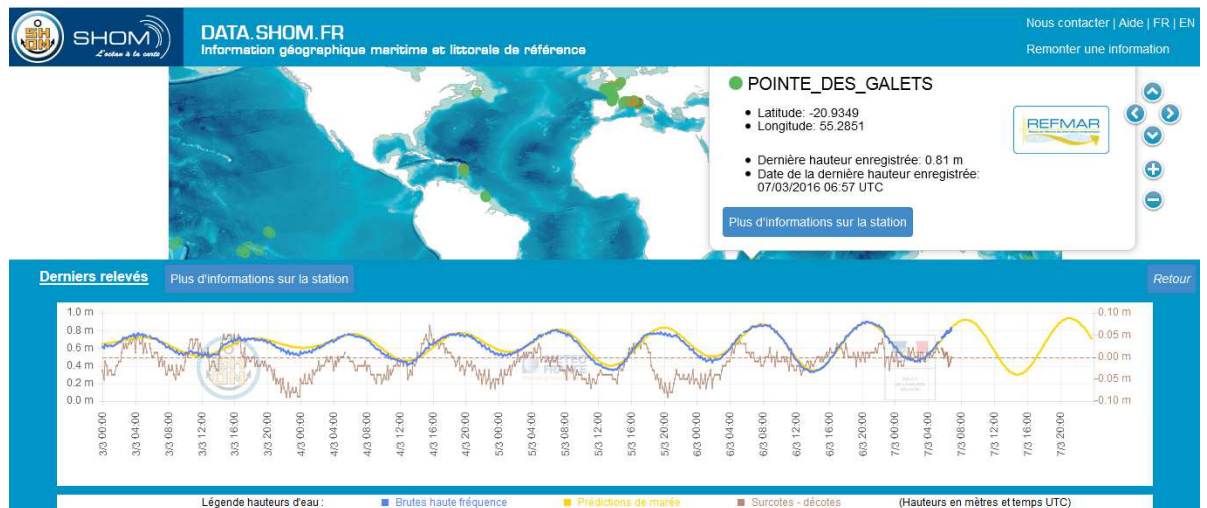
NTR.

## 8. Oceanographic activities

### 8.1. GEBCO/IBC's activities

### 8.2. Tide gauge network

SHOM is the French national coordinator and reference authority for the observation of the sea level, managing and issuing the resulting data. Besides, SHOM manages its own tidal network named RONIM. These missions are carried out under the REFMAR programme. All real time and processed tide gauge measurements collected under that programme are now accessible on web <http://data.shom.fr/#donnees/refmar> in areas under French jurisdiction.



*Fig.5: Real time measurements from REFMAR tidal network on SHOM's web portal (source: data.shom.fr)*

Besides, since May 2016, SHOM's tidal predictions have been made available through a new web/smartphone/tablet-friendly online service named [maree.shom.fr](http://maree.shom.fr). This new service provides free access of one year of tidal predictions from over 1,000 harbours worldwide.

In February 2016, SHOM has organized, in partnership with UNESCO's Intergovernmental Oceanographic Commission (IOC), the 2016 edition of the *REFMAR Days* at UNESCO headquarter in Paris. This 5 day meeting focused on the status of sea level observation and its multiple applications. About 200 people from 20 countries attended the event.

Presentation and information material presented at the event can be downloaded on: <http://refmar.shom.fr/journees-refmar-2016/programme>.

### 8.3. New equipment

NTR.

### 8.4. Problems encountered



Tide gauge station on Crozet Island, operated by LEGOS, was destroyed by a storm in 2015. This station is now considered too difficult to maintain. Replacement project has been put into a hold, until a better site is identified.

## 9. Other activities

### 9.1. Meteorological data collection

NTR.

### 9.2. Geospatial studies

NTR.

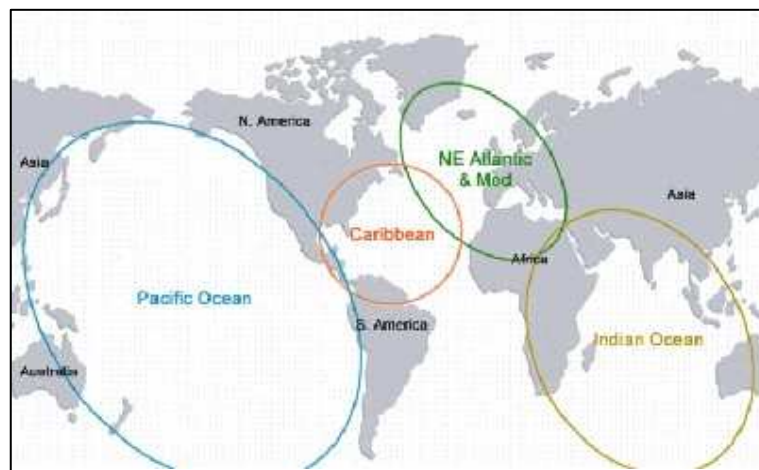
### 9.3. Disaster prevention

- **Tsunami :**

SHOM operates its own real-time tide gauge network named RONIM, an important tool for coastal operational oceanography, risk assessment, studies on the evolution of the mean sea level, etc. With 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.

France may also have Navy ships deployed in the SAIHC region, ready to provide support in case of an emergency. France also provides technical support and has a rapid response survey capacity 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](mailto:coord.navarea2@shom.fr).

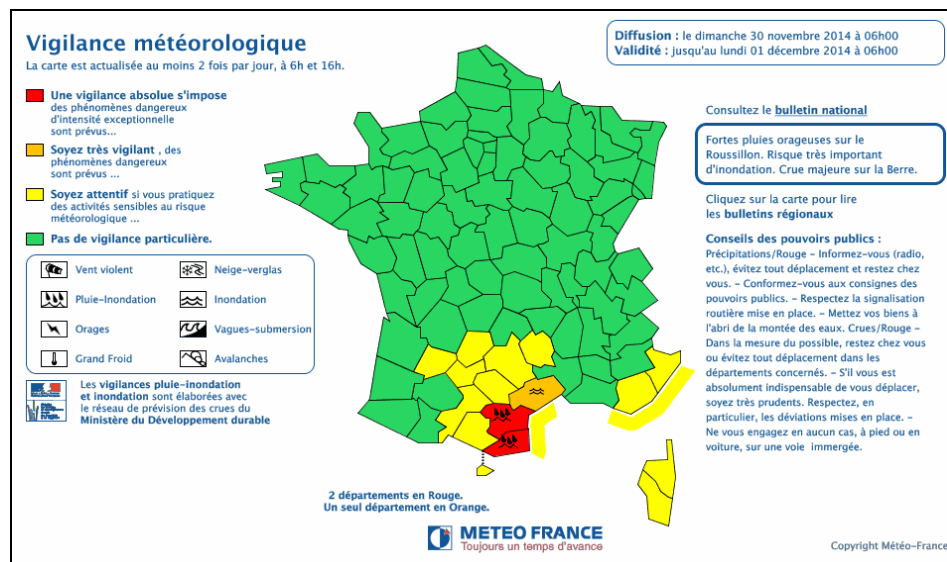


*Fig.6: Cooperation areas on tsunami warning system (source COI ; UNESCO).*

- **Coastal flooding :**

SHOM is associated with *Météo-France* in the provision of an alert system against coastal flooding named *Vigilance Vagues Submersion*. This allows for a better anticipation of this destructive phenomenon 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, expertise and models in coastal hydrodynamics and real time tide gauge observations as well as information relative to extreme sea levels and bathymetry. *Météo-France*'s marine forecasters examine and compile the data and produce a map depicting the level of coastal flooding threat together with the risk of tall waves for each French metropolitan department:



*Fig.7: An example of coastal flooding alert over Mediterranean coasts (yellow level). Coasts subject to alert are underlined according to the alert level (source [www.meteo.fr](http://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 23<sup>rd</sup> 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.

#### 9.4. Environmental protection

NTR.

#### 9.5. Astronomical observations

NTR.

#### 9.6. Magnetic/Gravity surveys

NTR.

#### 9.7. MSDI Progress

Since the launch of SHOM's maritime and coastal geographic information portal [data.shom.fr](http://data.shom.fr), further developments have been implemented with new online services data layers on a regular basis. Hereafter are listed the some of the latest evolutions:

- The portal is now displayed in Google Mercator (EPSG:3857).
- <http://data.shom.fr/#dessin> Drawing tools have been directly added to the main portal <http://data.shom.fr>. Users can now create objects, save their map and print it, export and import in KML format.
- The nautical info feedback service has also been integrated to the portal <http://data.shom.fr/#infonaut/>
- The metadata catalog is based on the Geonetwork solution that offers a user-friendly interface to read ISO 19115/19139 XMLs.
- Layers can be interrogated to retrieve attributes of objects.
- New high (10-20m) and medium (100m) resolution DTM Layers (open data).
- An online DTM creator will soon be launched.
- Wind forecasts (direction and speed) from *Météo France's* ARPEGE meteorological model ARPEGE are now available with SHOM's ocean modeling forecasts.

Those evolutions can all be followed via SHOM's Twitter account (@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 listed below: *tides, tidal currents, bathymetry, cartography, maritime and littoral databases.*

### 9.8. 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
GEBSCO		✓	Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of Oceans (GEBSCO)
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
S-100WG		✓	S-100 Working Group (former TSMADWG/DIPWG)
SAIHC		✓	Southern Africa and Islands Hydrographic Commission
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)
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## **10. Conclusions**

Following up the outcomes of the 14<sup>th</sup> Conference of Capacity Building Sub-Committee, France suggests that SAIHC should encourage the provision of information regarding bilateral CB initiatives from other Member States as well as from industry stakeholders. Besides, the definition of a new SAIHC consolidated regional CB project could be considered, in continuity with the World Bank funded WIOMH project. France is fully supportive to that approach and proposes that such discussion to take place at the forthcoming SAIHC Conference.