REPORT

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**FRANCE NATIONAL REPORT TO THE 16TH MEETING OF THE SOUTH-WEST PACIFIC HYDROGRAPHIC COMMISSION (SWPHC)**

## 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, approved by Shom's Board and the minister of Defence.

In addition to that, 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

Since the previous SWPHC conference in February 2018, Shom's survey unit in the Pacific, GOP, has conducted several surveys to improve and update hydrographic knowledge.

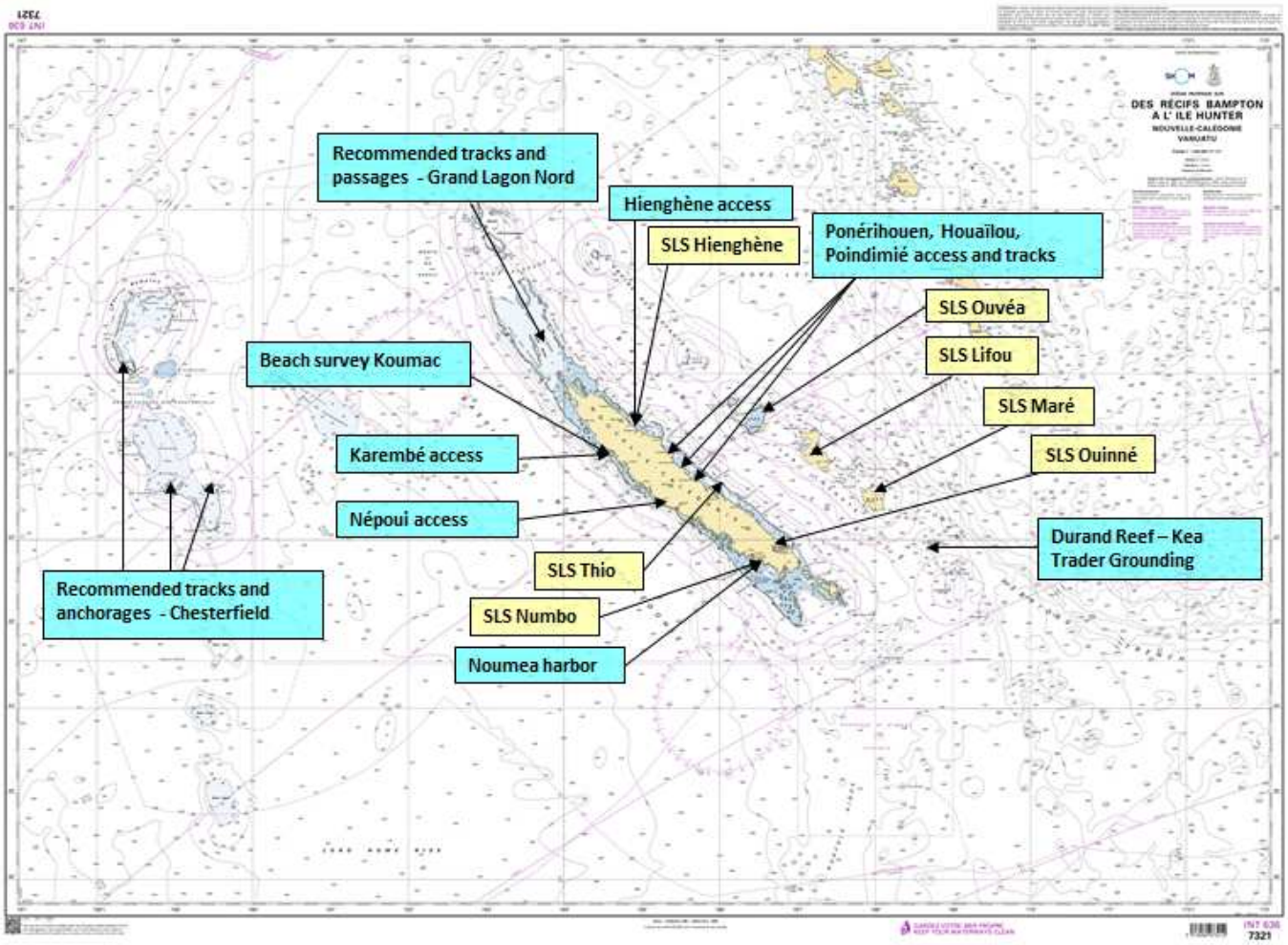
These surveys scheduled in close relation with local governmental authorities in the frame of a prioritized survey plan, to fulfil requirements expressed by local authorities, pilots, fishermen, mining operators and defence.

More precisely, the GOP conducted the following surveys depicted hereafter.

**In New Caledonia**:

Several surveys of ports, bays, recommended tracks and passages have been performed all around New-Caledonia, mainly inside the lagoon, as summarized by figure 1 and illustrated by figures 2 to 10.

- Surveys:
  - Opening of new recommended tracks and passages in unsurveyed areas: Grand Lagon Nord, between Belep Islands and Passe D'Estrées (figure 2);
  - Control survey of Karembé anchorage area and access channel through Passe de Koumac (figure 3);
  - Control survey of access channel to Hienghène (figure 4), Houaïlou (figure 5), Ponérihouen (figure 6), and Poindimié (figure 7), and the first part of a new recommended track between Poindimié and Touho (figure 8);
  - Control survey of Passe de Muéo and recommended track to Népoui (figures 9 10 and 11);
  - Survey updates in Nouméa harbor;
  - Miscellaneous surveys of anchorage areas in Chesterfield reefs and islands (figures 12, 13 and 14);
  - Beach survey in Koumac in support to *Croix du Sud* 2018 multinational exercice (figure 15).
- Hydrographic support (survey expertise, tide prediction and analysis) after Kea Trader grounding on Durand Reef
- Maintenance of Sea Level Stations (SLS) network dedicated to sea level observation and tsunamis warning system.




*<u>Fig.1:</u> Surveys achieved in New Caledonia by GOP since February 2018.*

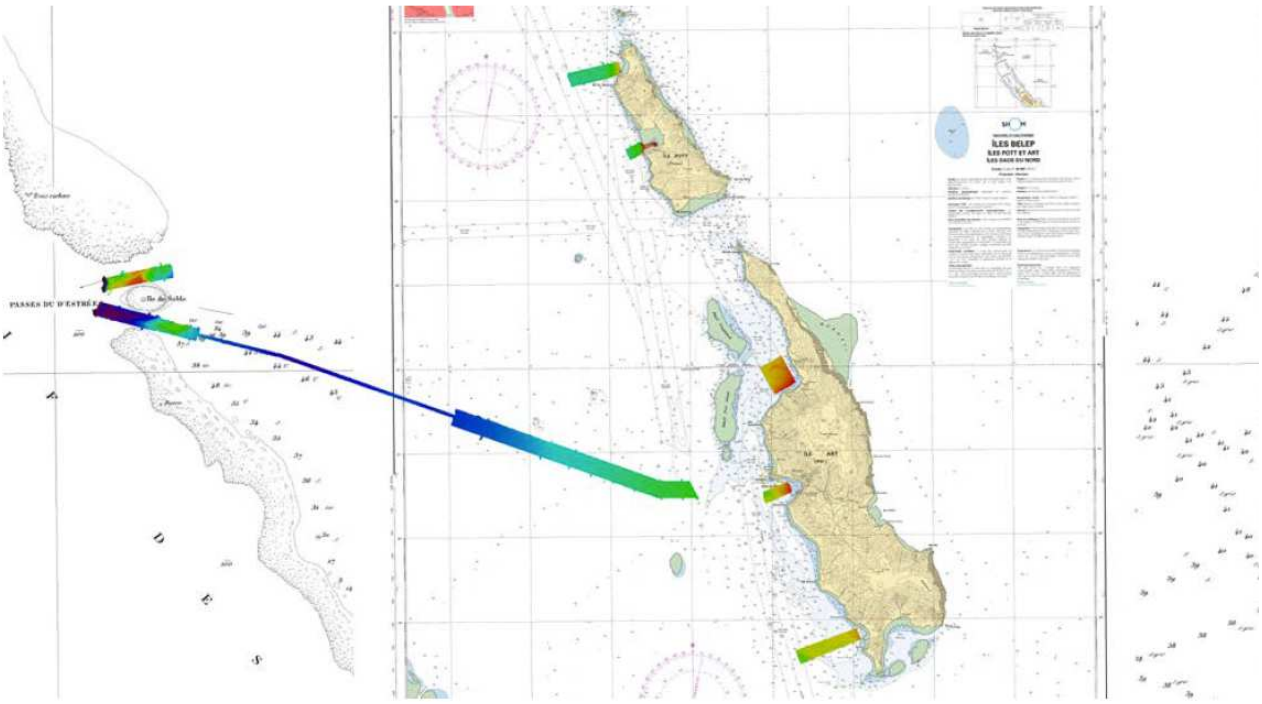


*Fig.2: Surveys around Belep Islands and Passe D'Estrées.*

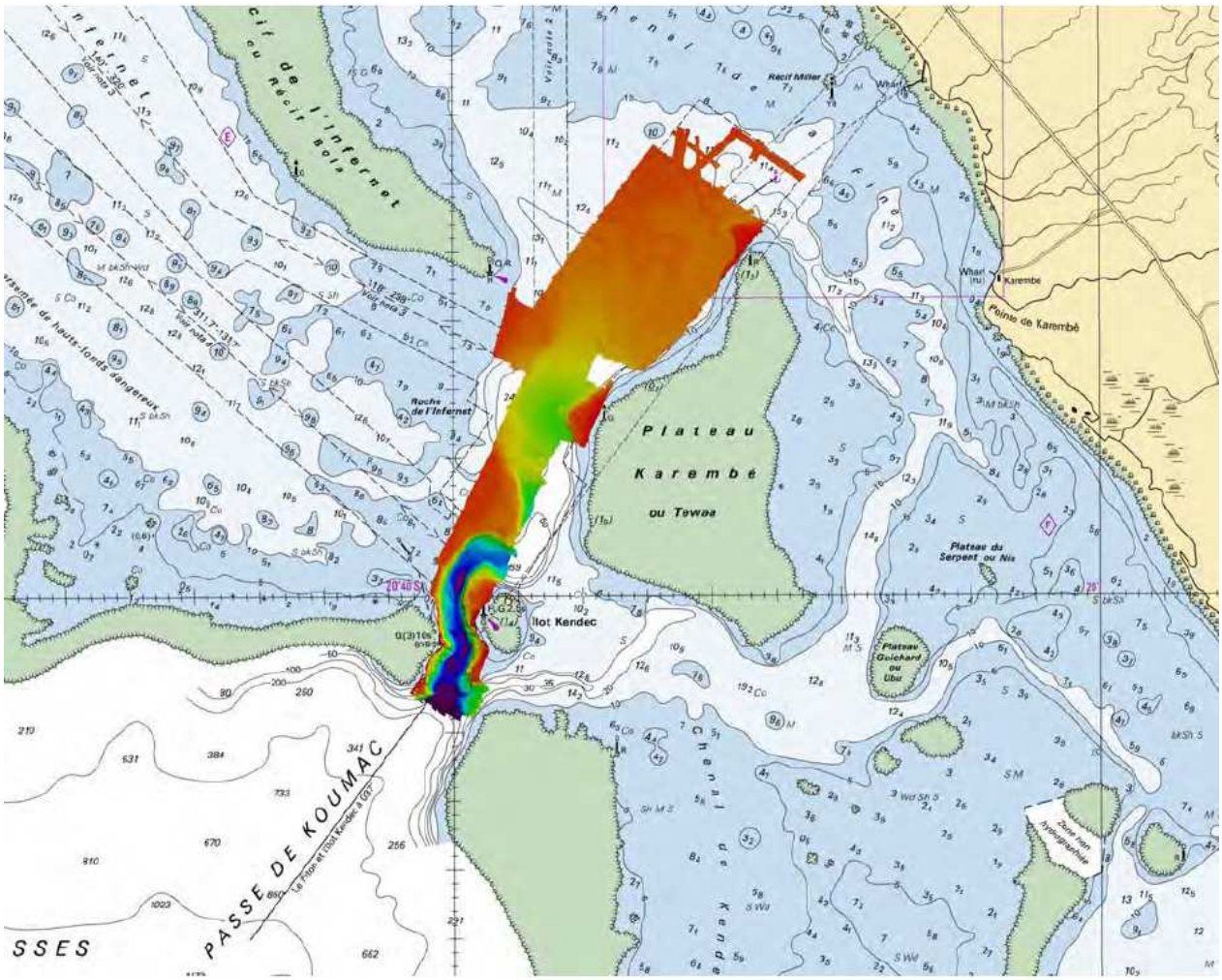



*Fig.3: Control survey of Karembé anchorage area and access channel.*

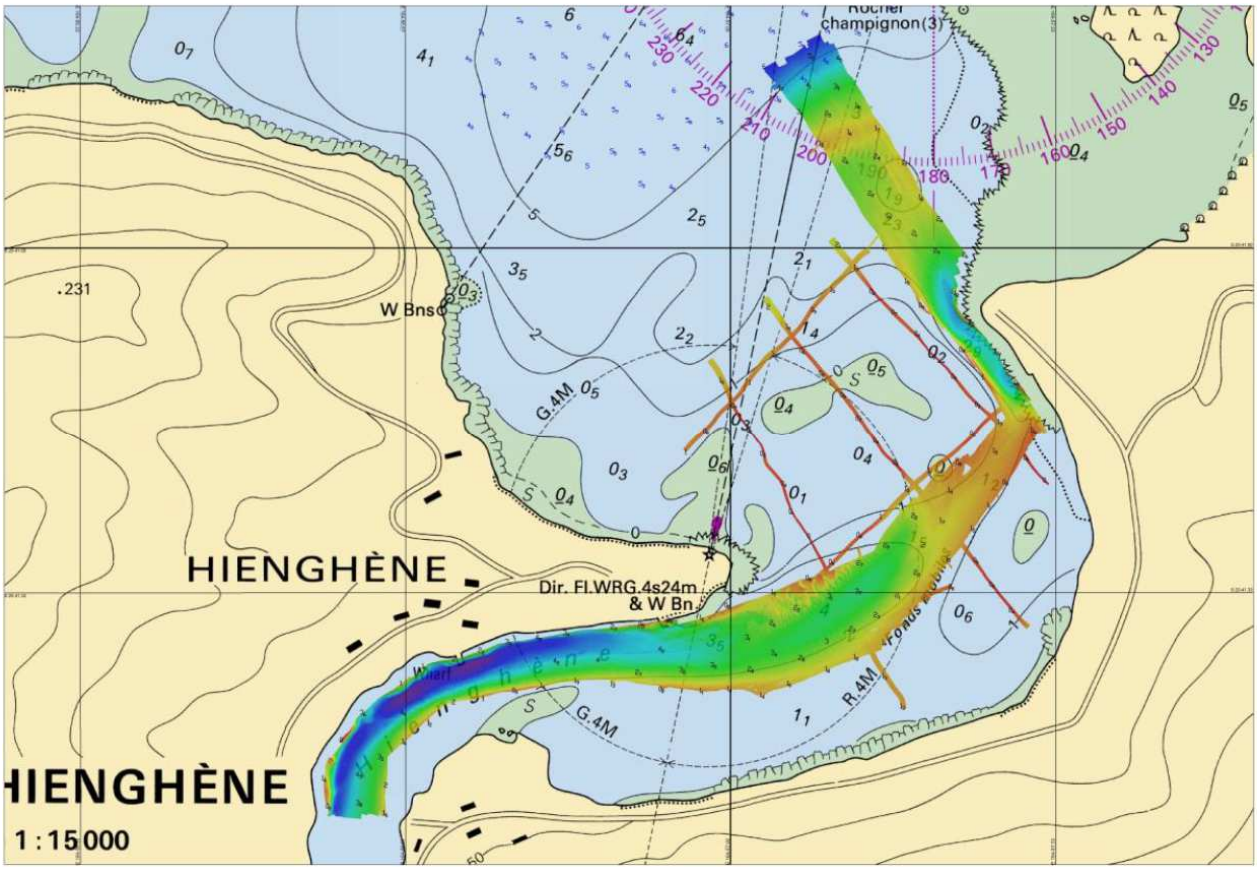



*Fig.4: Control survey of Hienghène access channel.*

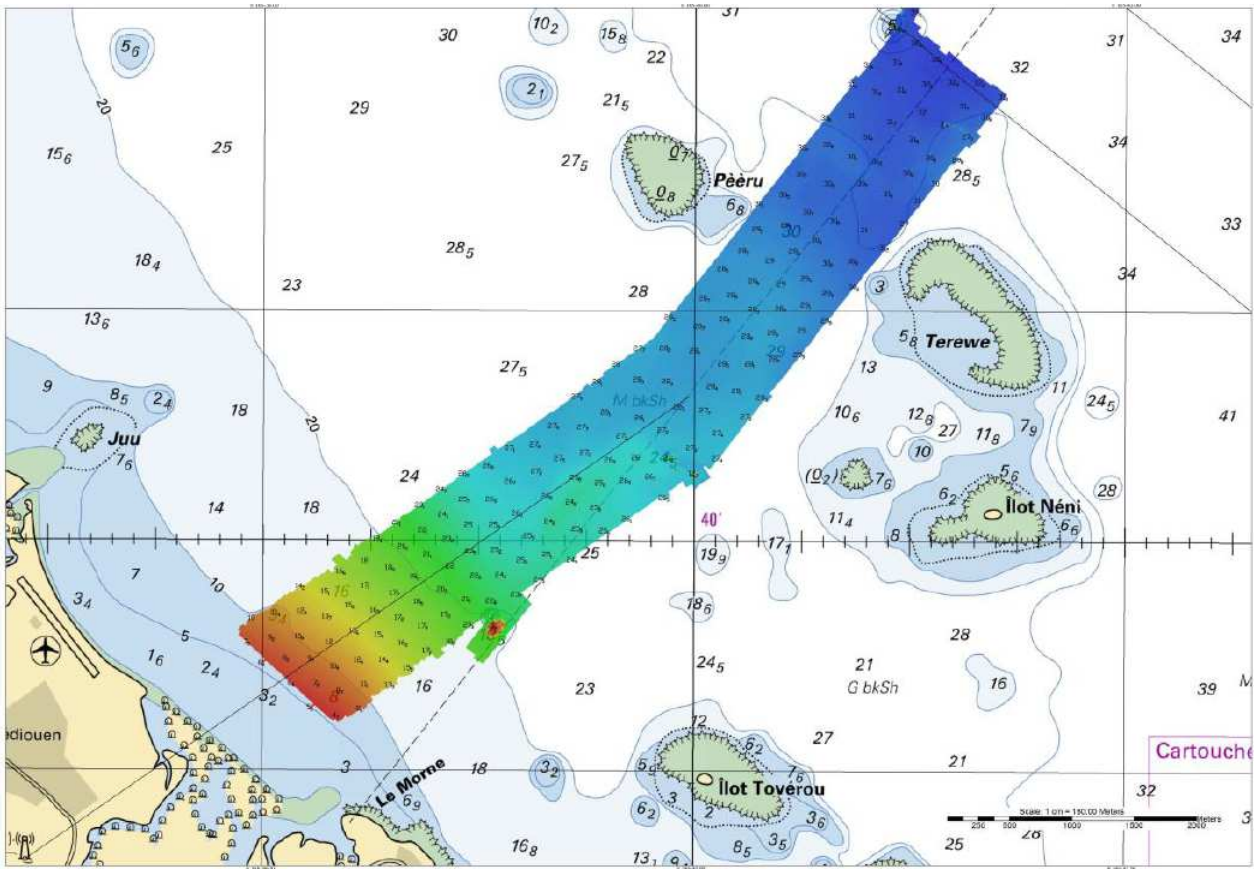



*Fig.5: Control survey of Houaïlou access channel.*

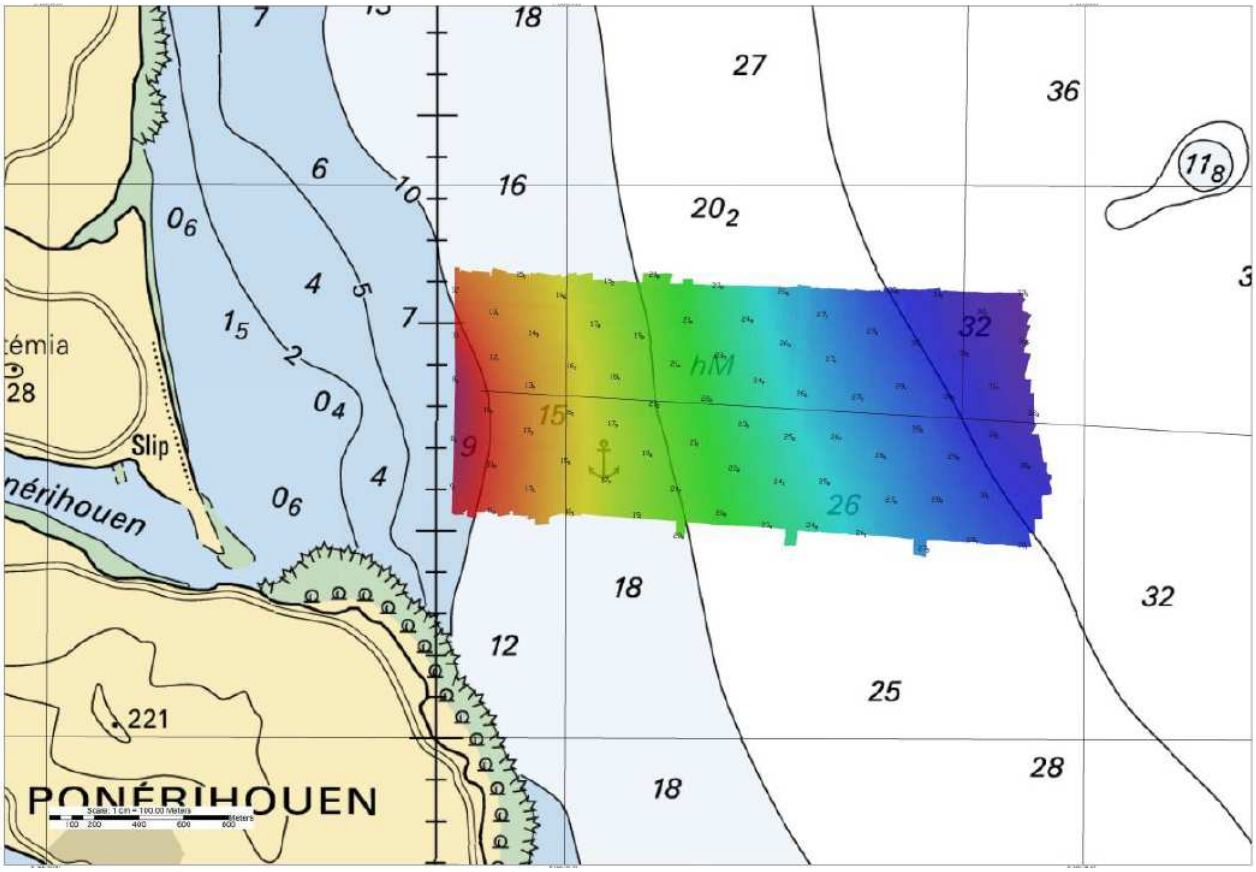



*Fig.6: Control survey of Ponérihouen access channel.*

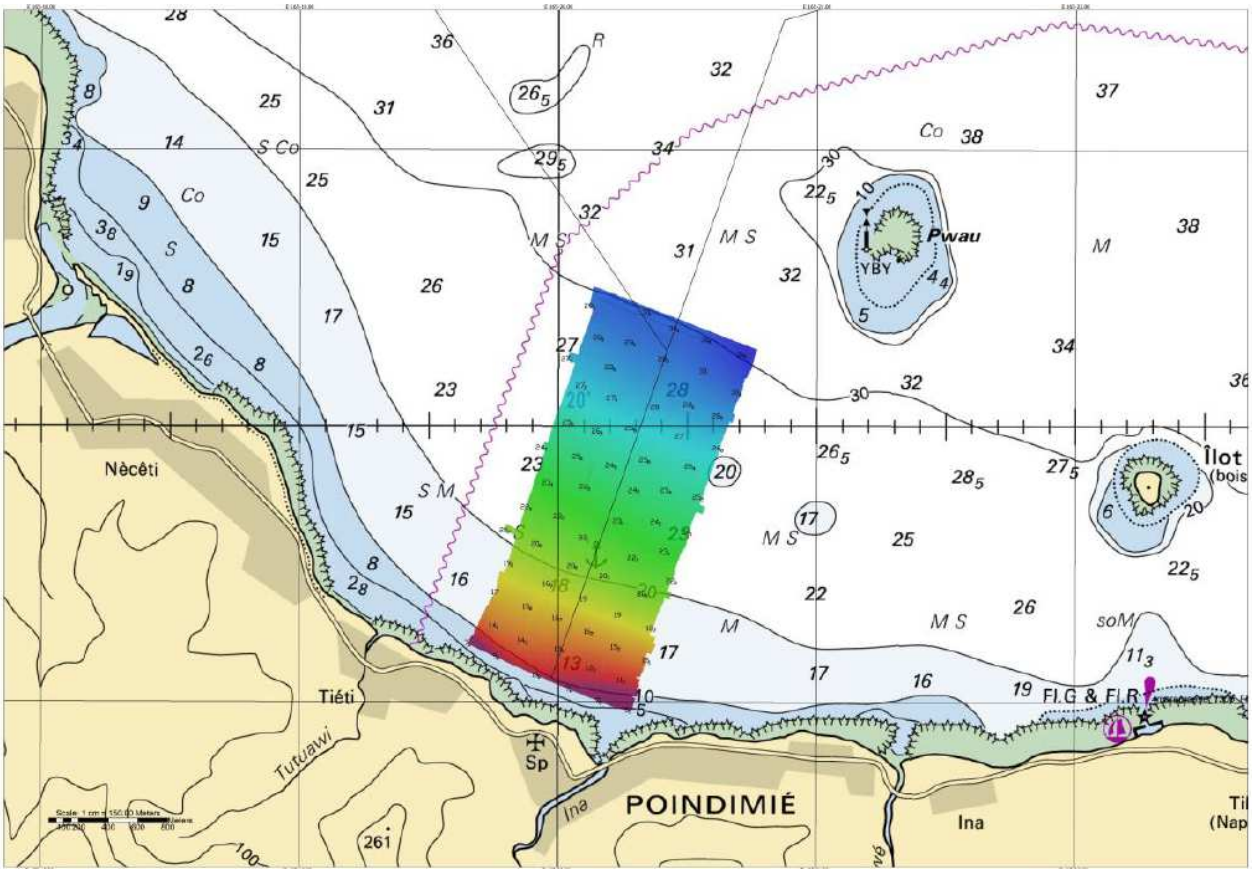



*Fig.7: Control survey of Poindimié access channel.*

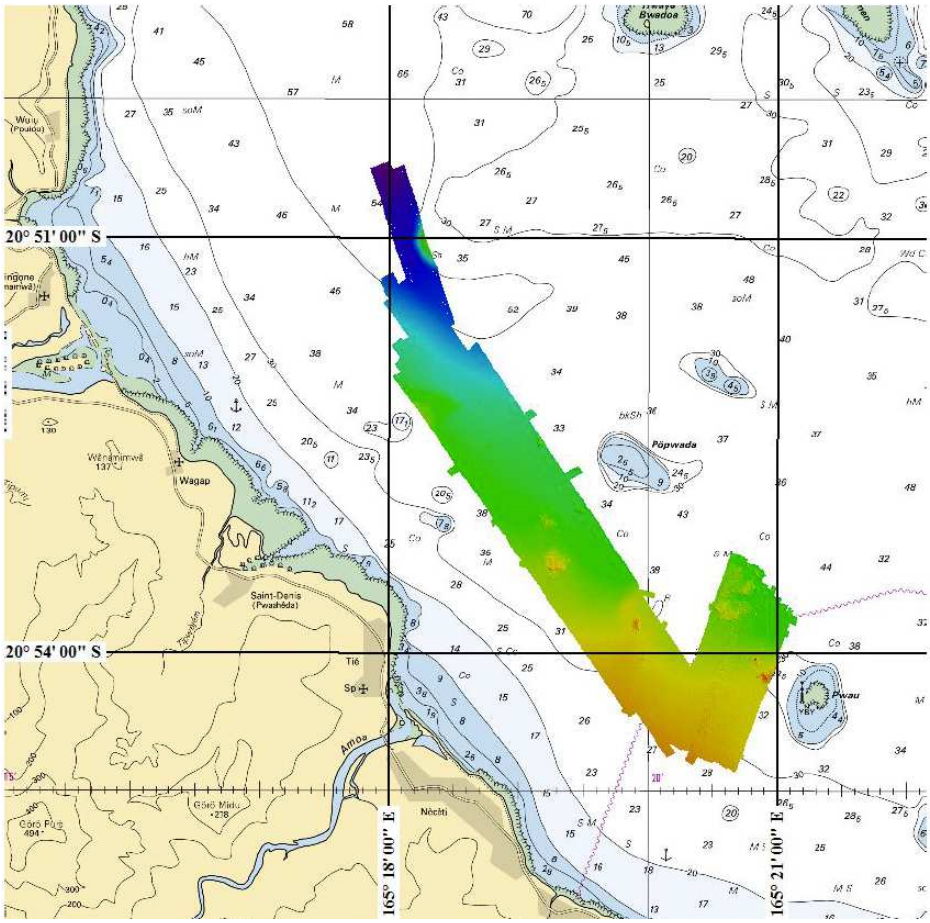



*Fig.8: Survey of recommended track between Poindimié and Touho.*

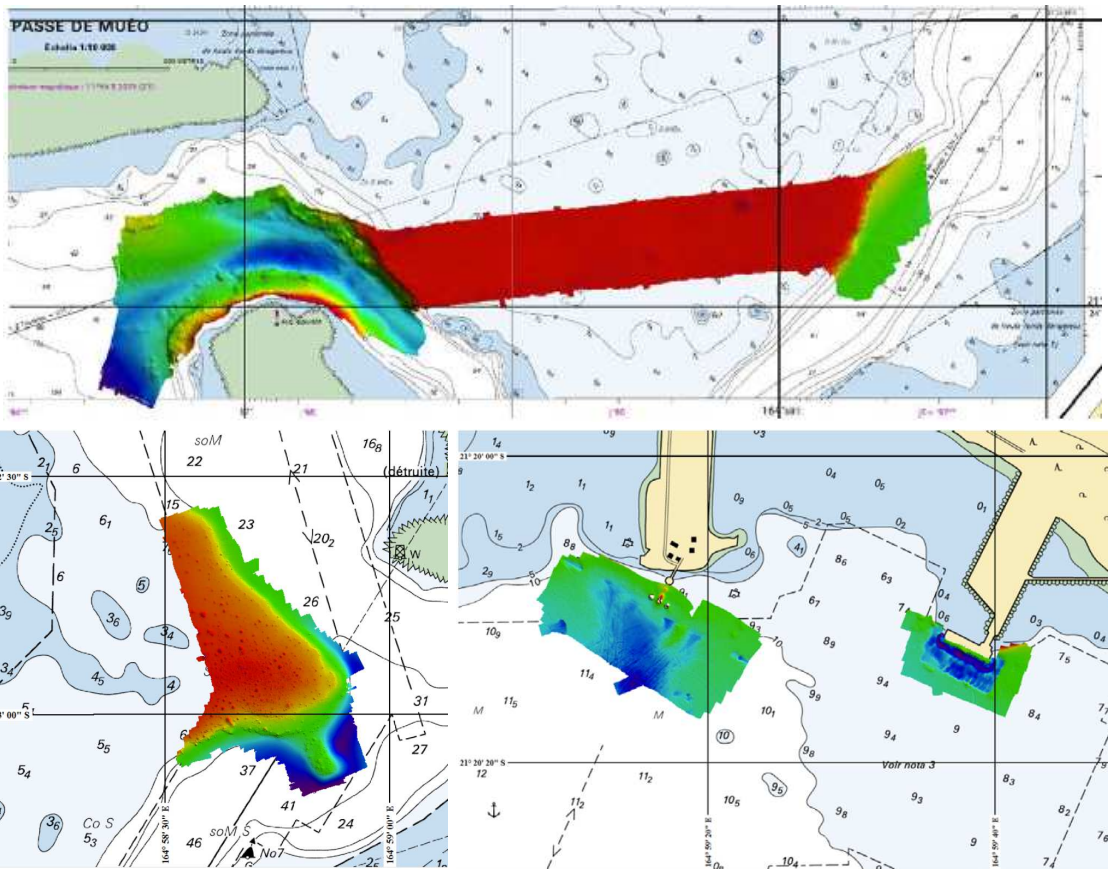



*Fig.9,10 & 11: Control surveys of Passe de Muéo and recommended track to Népoui*

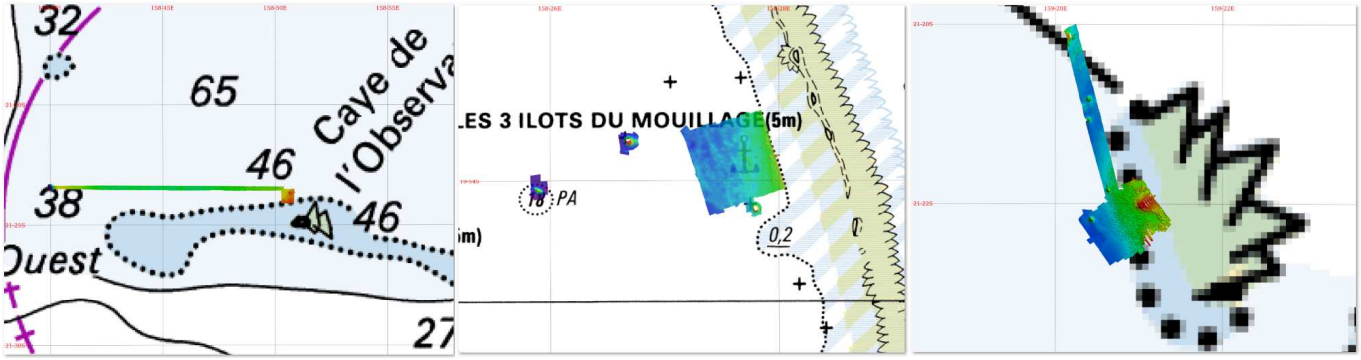



*Fig.12, 13 & 14: Miscellaneous surveys of anchorage areas in Chesterfield reefs and islands*

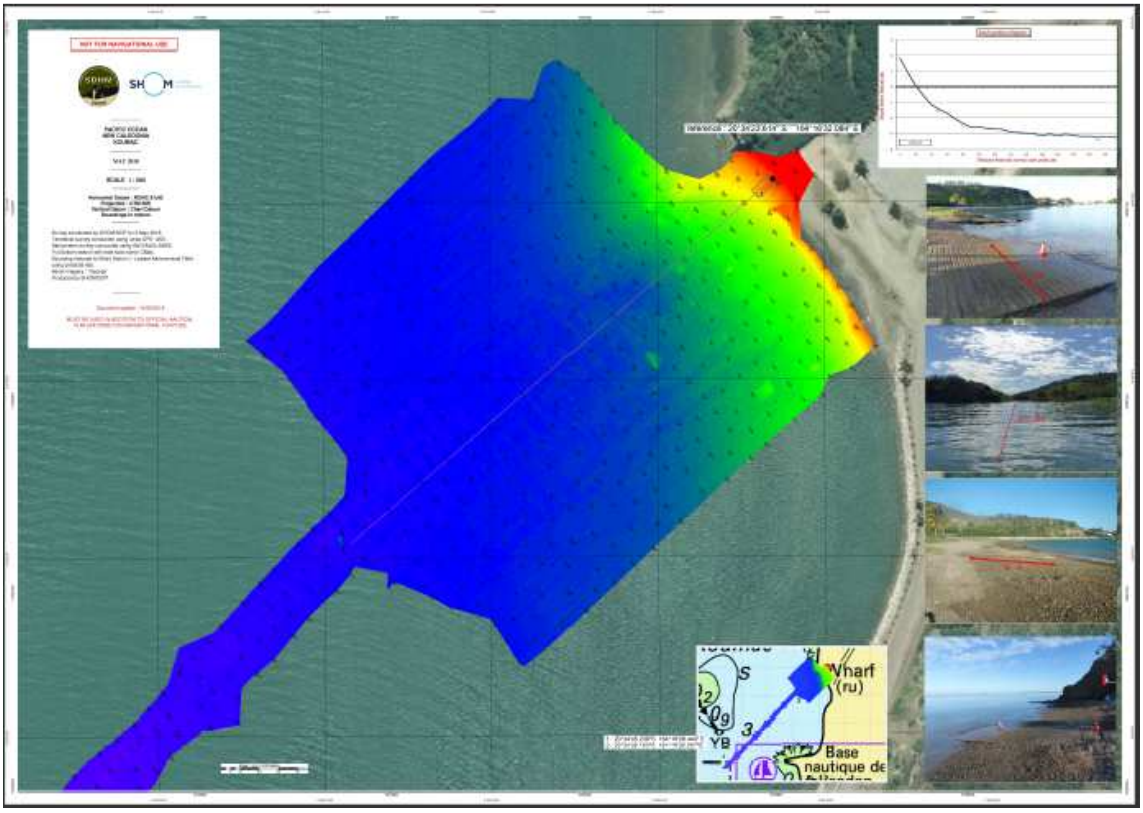



*Fig.15: Beach survey in Koumac in support to Croix du Sud 2018 multinational exercise*

**In French Polynesia**:

Surveys and "spatiopreparation" & "stereopreparation" field works (for exploitation of satellite & aerial images) have been conducted since Februrary 2018 in the French Polynesian islands: Fangataufa, Maupihaa and Rangiroa.

The GOP maintained the Sea Level Stations (SLS) network deployed in French Polynesia.

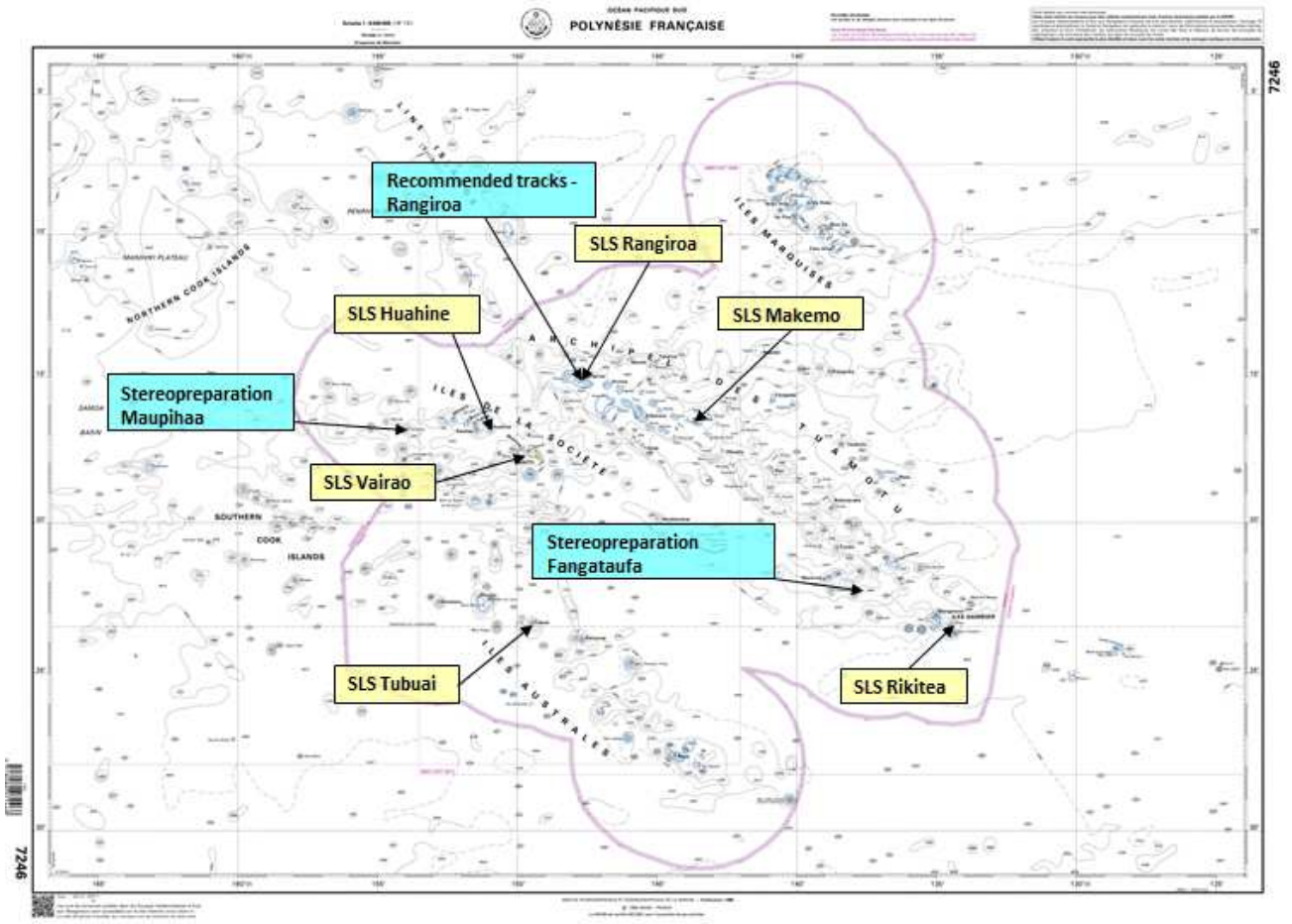



*Fig.16: Surveys achieved in French Polynesia since February 2018.*

The GOP started the survey of new recommended tracks and anchorage areas in Rangiroa's lagoon (figure 17).

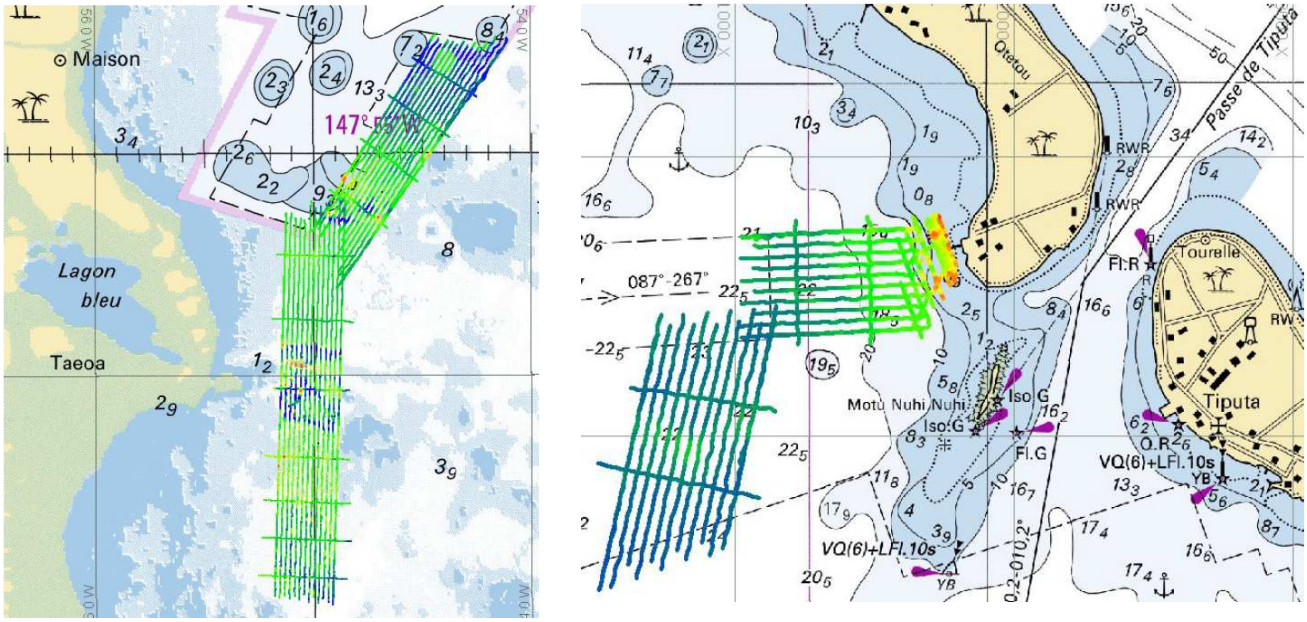



*Fig.17: Surveys in Rangiroa's lagoon*

**In Wallis & Futuna**:

NTR.

## 2.2. LIDAR Surveys

These data, critical for coastline management and risks prevention, are freely available through Shom's data portals:

Data.shom.fr (Shom catalog / Master data / Coastal altimetry): data.shom.fr

Diffusion.shom.fr: http://diffusion.shom.fr/pro/risques/altimetrie-littorale/lidar-polynesie-francaise-2015.html for French Polynesia

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

Discussions are ongoing with local governments of New Caledonia and French Polynesia to conduct new surveys, yet to be finalized. In particular, the Shom provided area and cost estimates in anticipation of an extension of the bathymetric lidar survey to the entire island of Tahiti in 2019.

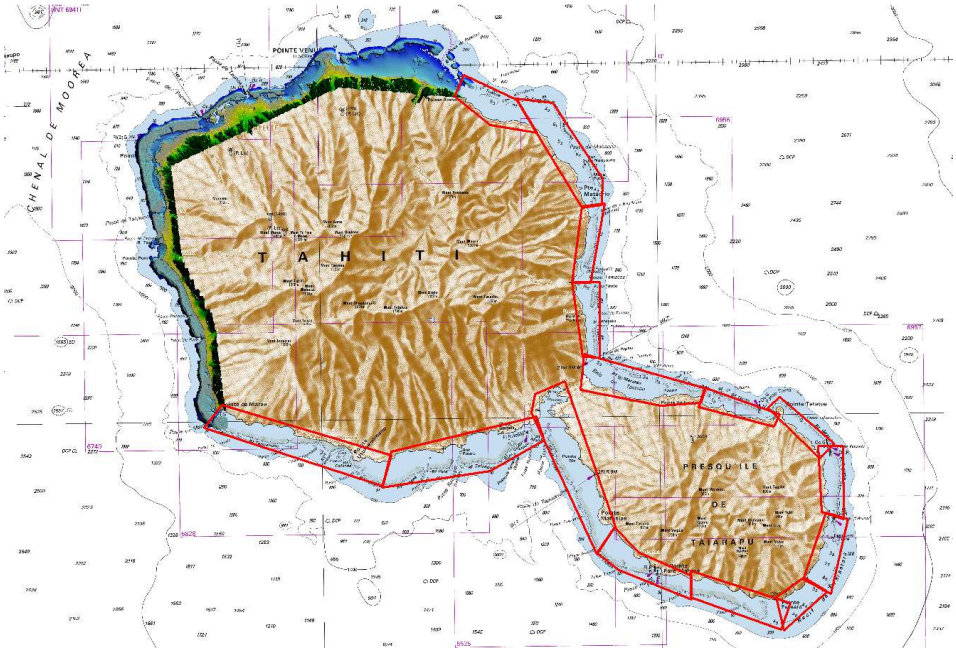



*Fig.18: Estimation of the additional lidar survey on Tahiti*

## 2.3. Shom's survey programme for the region

Shom's 2017-2020 national hydrographic survey programme[1] details the long-term targeted objectives of CATZOC compliant hydrographic surveying in New Caledonia, French Polynesia and Wallis et Futuna waters and the current surveys coverage for those three areas.

The survey work related to those areas for the next three years is detailed hereafter:

- **New Caledonia**:

  Prioritized survey works defined by the hydrographic commission of New Caledonia, in the framework of the cooperation in hydrography between the State and the government of New Caledonia (convention related to competences transfer, signed on March 2012).

- **French Polynesia**:

  Survey works in lagoon waters (using deployable equipment) and opportunity surveys.

- **Wallis & Futuna:**

  Survey works in lagoon waters (using deployable equipment) and opportunity surveys.

In 2019, surveys will be performed with the N/O *L'Atalante* both in French Polynesia, Wallis & Futuna and in New Caledonia.

[1] http://www.shom.fr/fileadmin/data-www/01-LE_SHOM/01-PRESENTATION_GENERALE/06-LE_PROGRAMME_ANNUEL/PNH_2017-2020_WEB_BD.pdf

## 2.4. New technologies and / or equipment

***New Caledonia:***

HSL *Chambeyron* is equipped since February 2018 with shallow water multibeam echosounders (Konsberg Maritime; EM2040P), position and motion sensor (SBG; Navsight Marine Solution EKINOX), sound velocity sensor (Valeport; MiniSVS), deployed on a removable pole (Universal Sonar Mount).


*Fig.19 & 20: HSL Chambeyron with multibeam echosounder.*

Buoy-Laying Vessel *Louis Hénin* is equipped since December 2018 with the same systems (EM2040P, Navsight Marine Solution EKINOX and MiniSVS), hulled mounted. A Sippican Expendable Bathythermographic Temperature Probe has also been installed.

*Fig.21: Multibeam echosounder installed on Buoy-Laying Vessel* Louis Hénin

Shom is now able to conduct multibeam surveys from 1 to 400 m water depths.

- **French Polynesia**:

In 2019 HSL *BHPF1* will be equipped with shallow water multibeam echosounders (Konsberg EM2040P).

### 2.5. New ships

NTR.

### 2.6. Problems encountered

NTR.

## 3. New charts & updates

### 3.1. ENCs

As of 1st January 2019, Shom has produced some 668 ENCs, of which 166 ENCs within region L.

The full collection should eventually reach a figure of the order of 900 ENCs, with an approximate rate of 50 new cells per year.

By the end of 2018, full coverage of New Caledonian waters in ENCs has been achieved.

Concerning French Polynesian waters, the most frequented routes used by passengers and freight vessels (not concerned by IMO Mandatory ECDIS carriage regulation) are covered by 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 L is detailed in the table below (*changes in red*):

| Usage Band | Produced Cells | Planned Cells | Percentage |
|---|---|---|---|
| 1 | 1 | 1 | 100% |
| 2 | 13 | 13 | 100% |
| 3 | **12** | 23 | **52%** |
| 4 | **46** | 68 | **68%** |
| 5 | **66** | 150 | **63%** |
| 6 | **28** | | |
| **Total** | **166** | 255 | **65%** |

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

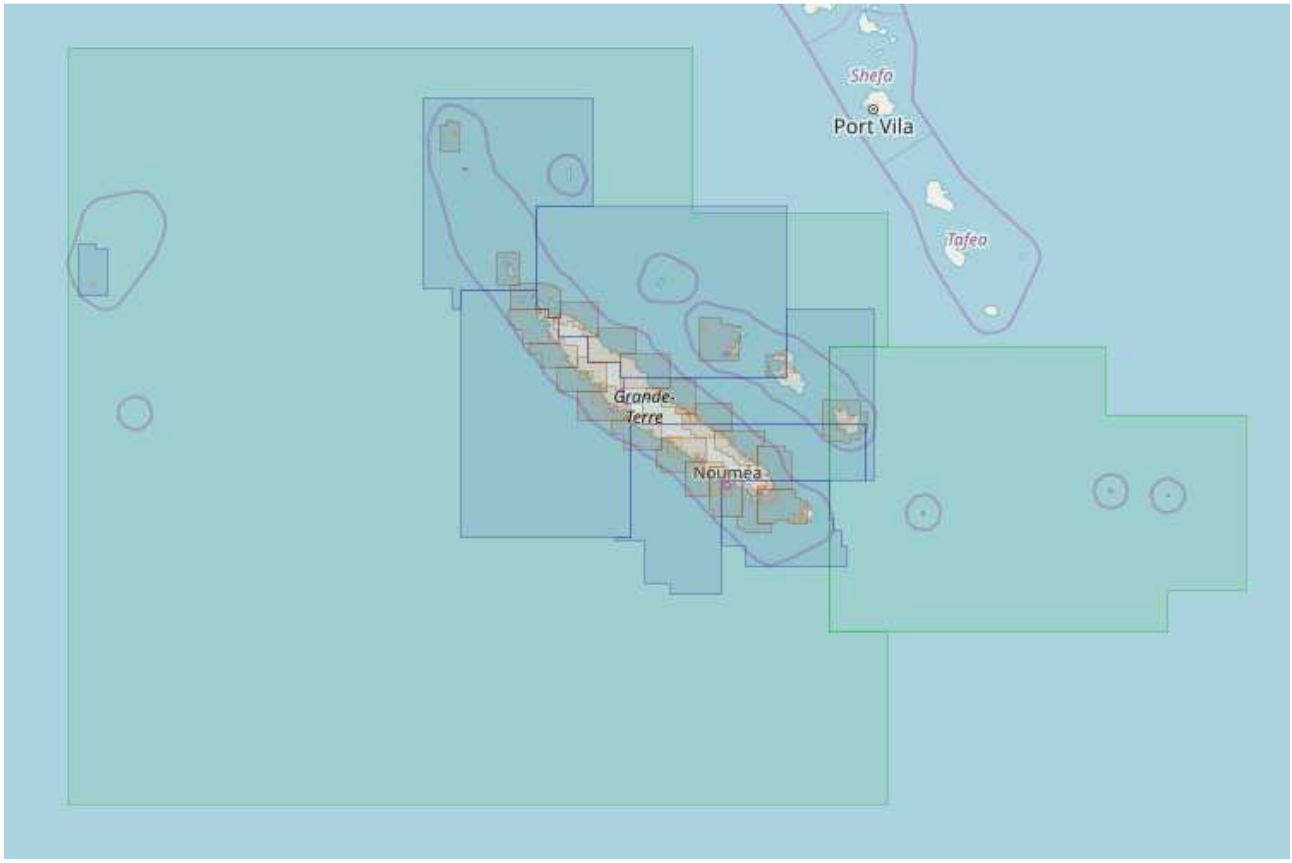



*Fig.22: Region L - Shom's ENC production - New-Caledonia (Nouvelle-Calédonie)*

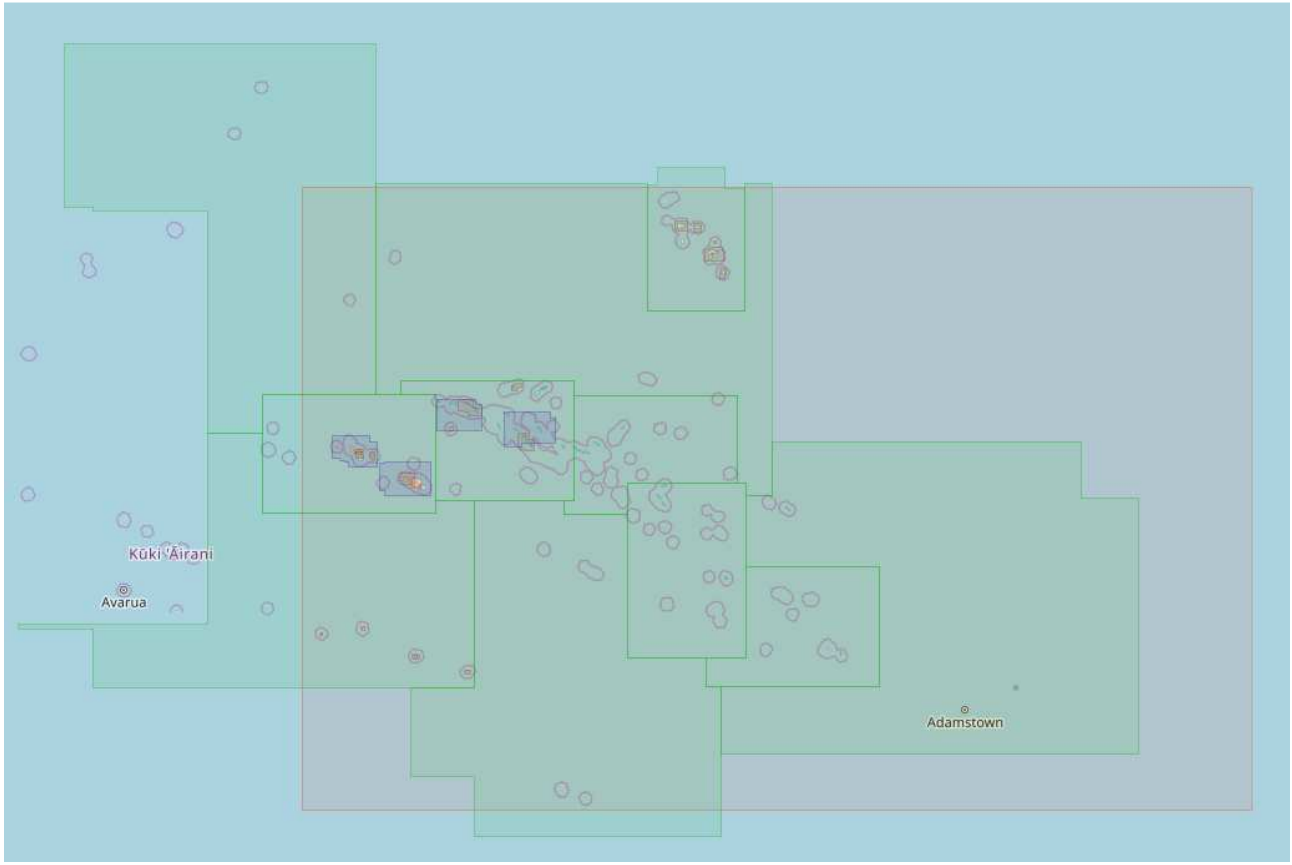



*Fig.23: Region L - Shom's ENC production - French Polynesia (Polynésie française)*

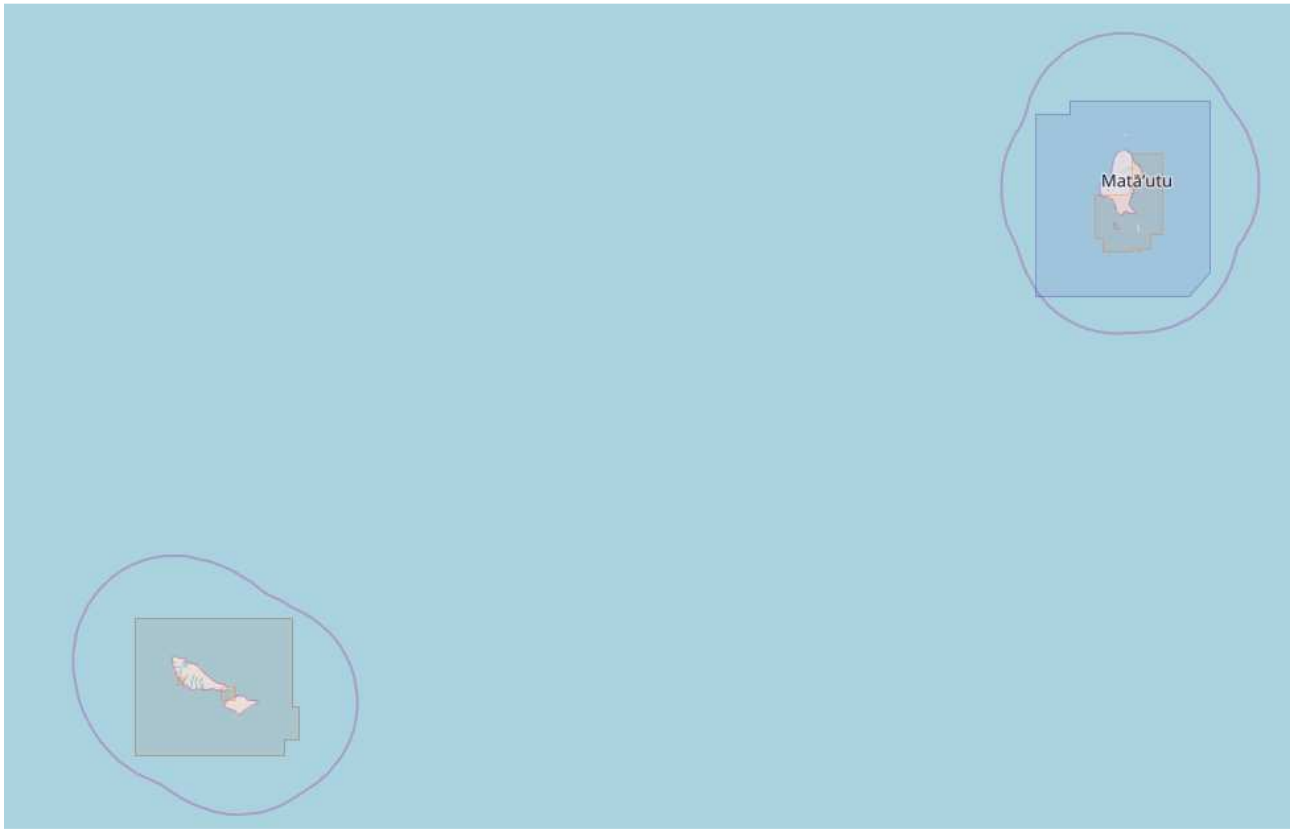



*Fig.24: Region L - Shom's ENC production – Wallis & Futuna*

ENC cells produced since the last conference are detailed hereafter:

| Number | Scale 1 : | Title |
|---|---|---|
| FR35978B | 90 000 | Reefs and Chesterfield Islands |
| FR364200 | 90 000 | Tuamotu Island - Mataiva to Rangiroa and Makatea |
| FR372600 | 90 000 | Apataki to Fakarava |
| FR377600 | 180 000 | Nouvelle-Calédonie - Northern part - Récifs d'Entrecasteaux |
| FR377610 | 180 000 | Nouvelle-Calédonie - Northeast part |
| FR45978C | 90 000 | Huon atoll |
| FR461650 | 22 000 | French Polynesia - Rurutu |
| FR462070 | 22 000 | Raivavae Island (Vavitu) - Polynésie Française - Îles Australes |
| FR46279A | 22 000 | Polynésie Française - Iles Australes - Rimatara |
| FR463200 | 22 000 | Makatea |
| FR464240 | 22 000 | Île Tubuai - Polynésie Française - Îles Australes |
| FR47049A | 22 000 | Walpole island - South Pacific ocean |
| FR47049B | 22 000 | Matthew island - South Pacific ocean |
| FR47049C | 22 000 | Hunter island - South Pacific ocean |
| FR47248A | 45 000 | Îles Tuamotu - Apataki |
| FR472930 | 45 000 | Manihi - Tuamotu islands |
| FR47355B | 45 000 | Fatu Huku |

| | | |
|---|---|---|
| FR55978A | 12 000 | Chesterfield Islands - Île Longue mooring |
| FR55978D | 12 000 | Île Huon mooring - South Pacific ocean - Coral sea |
| FR56434B | 8 000 | Huahine - Passe Farerea |
| FR567400 | 22 000 | Passe de Toapiro to Baie de Punaauia |
| FR56820A | 12 000 | Doking bay |
| FR568280 | 22 000 | From Atehiti to Maraa - Tahiti South-West coast - Polynésie Française |
| FR57011A | 12 000 | New Caledonia - Port-Ounia |
| FR57052A | 45 000 | Uapan mooring - Nouvelle-Calédonie |
| FR57097B | 22 000 | Coupée Mara and Baie de Moindou |
| FR572130 | 22 000 | Maupiti |
| FR57259A | 12 000 | Allier Bay (Puan Bay) - La Roche mooring |
| FR57259B | 12 000 | Baie de Niri |
| FR57259D | 12 000 | North bay (Waeko bay) - Loyauté islands |
| FR57319A | 12 000 | North coast of Nouvelle Calédonie - Pam bay |
| FR57319B | 22 000 | Havre de Balade |
| FR57319C | 22 000 | Pouébo Harbour and Tchevit Bay |
| FR573510 | 22 000 | Passe de Goyeta to Passe de Koné |
| FR66165A | 8 000 | Rurutu - Baie d'Avera |
| FR66165B | 8 000 | Rurutu - Baie de Moerai |
| FR66207A | 8 000 | Raivavae island northern pass - Polynésie Française |
| FR66279B | 8 000 | Northern anchorages of Rimatara - Polynésie Française - Îles Australes |
| FR66320A | 8 000 | Makatea - Port de Temao |
| FR664180 | 4 000 | Ile Mangareva - Rade de Rikitea |
| FR66424A | 12 000 | Passes and anchorages of Tubuai - Polynésie Française - Îles Australes |
| FR67213A | 8 000 | Passe 'Onoiau to Village |
| FR67248B | 8 000 | Tehere Pass (Aimonu) - Roto Ava Mooring |
| FR67248C | 8 000 | Passe Pakaka (Haniuru) - Quai de Niutachi |
| FR67293A | 4 000 | Manihi - Tairapa pass - Tuamotu islands |
| FR67354C | 8 000 | Hiva-Oa - Puamau Bay |
| FR67354E | 8 000 | Hiva-Oa - Hanatekuua Bay |
| FR67355A | 8 000 | Mohotani - Baie de Puioono |

ENC cells planned for 2019 are listed below:

| Number | Scale 1: | Title |
|---|---|---|
| FR462840 | 22 000 | Partie Sud de Raiatea |
| FR47248D | 22 000 | Apataki - Lagon Ouest - De la Passe Tehere à la Passe Pakaka |

| | | |
|---|---|---|
| FR474590 | 22 000 | Tikehau |
| FR57459A | 8 000 | Tikehau - Mouillage de Tuherahera |
| FR57459B | 4 000 | Tikehau - Passe Tuheiava |
| FR372830 | 700 000 | Wallis et Futuna |
| FR47462 | 45 000 | Amanu |
| FR47463 | 45 000 | Katiu |
| FR36033A | 90 000 | Manuae (Scilly) |
| FR36033B | 90 000 | Maupihaa (Mopélia) |
| FR36033C | 90 000 | Motu One (Bellingshausen) |
| FR461760 | 22 000 | Maupihaa (Mopélia) |
| FR56176A | 8 000 | Maupihaa - Entrée du lagon et mouillage |
| FR66176B | 4 000 | Maupihaa - Passe Taihaaru Vahine |
| FR464610 | 45 000 | Îles Gambier |
| FR464620 | 22 000 | Îles Gambier – Partie Sud |
| FR564630 | 12 000 | Île Mangareva – Passes de l'Ouest |
| FR564640 | 12 000 | Île Mangareva – Rikitea - Totegie |
| FR366040 | 90 000 | De Mururoa à Fangataufa |
| FR472810 | 45 000 | Hao |
| FR57281A | 22 000 | Hao - De la passe Kaki aux mouillages d'Otepa |
| FR67281B | 8 000 | Hao - Passe Kaki |
| FR67281C | 8 000 | Hao - Zone Portuaire Nord |
| FR67281D | 8 000 | Hao - Mouillages d'Otepa |
| FR473140 | 45 000 | Ahe |
| FR57314A | 8 000 | Ahe - Passe Tiareroa |
| FR57314B | 8 000 | Ahe - Mouillage de Tenukupara |
| FR473290 | 45 000 | Kauehi |
| FR57329A | 22 000 | Kauehi - De la passe Arikitamiro au mouillage de Tearavero |
| FR67329B | 4 000 | Kauehi - Passe Arikitamiro |
| FR67329C | 8 000 | Kauehi - Mouillage de Tearavero |
| FR57352A | 8 000 | Nuku-Hiva - Baie Haahopu |
| FR57352B | 8 000 | Nuku-Hiva - Baies d'Aakapa, d'Hatiheu et d'Anaho |
| FR57352D | 8 000 | Nuku-Hiva - Baie du Contrôleur |
| FR57352E | 8 000 | Nuku-Hiva - Baie de Taioa |
| FR57354A | 8 000 | Hiva-Oa - Baie Hanamenu |
| FR57354B | 8 000 | Hiva-Oa - Baie Hanaiapa |
| FR57354I | 8 000 | Tahuata - Baies du Nord-Ouest |
| FR57354J | 8 000 | Tahuata - Baie Motopu |
| FR57354K | 8 000 | Tahuata - Baie Vaitahu |

| | | |
|---|---|---|
| FR57354L | 8 000 | Tahuata - Baie Hanatetena |
| FR57354M | 8 000 | Tahuata - Baie Hapatoni |
| FR57354N | 8 000 | Tahuata - Baie Hanateio |
| FR57372C | 8 000 | Fakarava - Passe Tumakohua |
| FR474530 | 45 000 | Makemo |
| FR57453A | 8 000 | Makemo - Passe Tapuhiria |
| FR57453B | 8 000 | Makemo - Passe Arikitamiro |
| FR474540 | 45 000 | Faaite |
| FR57454A | 4 000 | Faaite - Passe Teporioha |
| FR57455K | 8 000 | Arutua - Passe Porofai |
| FR474630 | 45 000 | Katiu |
| FR474630 | 4 000 | Katiu – Passe Pakata |

### 3.2. ENC Distribution method

All French ENCs (S-63 encrypted format) are distributed to End User Service Providers by PRIMAR RENC. Frances 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 are the INT charts produced since the last conference:

| INT | Scale 1: | Title | Comment |
|---|---|---|---|
| 6840 | 307 000 | Nouvelle-Calédonie (Partie Nord) – Récifs d'Entrecasteaux | FR7760 – New Chart |
| 6841 | 305 000 | Nouvelle-Calédonie (Partie Nord-Est) | FR7761 – New Chart |
| 6882 | 60 000 | Du Mont Dore à Port-Boisé - Passes de Mato et de Uatio | FR6827 – Limited Edition |

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

| INT | Scale 1: | Title | Comment |
|---|---|---|---|
| 6843 | 300 000 | Nouvelle-Calédonie (partie Sud-Est) - Iles Loyauté | FR6686 |
| 6844 | 300 000 | Nouvelle-Calédonie (partie Sud) - Ile des Pins | FR6768 |

Concerning New Caledonia's coastal scheme, France is currently producing five 1: 300 000 scheme covering the main island and its vicinities. Therefore, France has submitted these five charts under national numbers **FR7760**, **FR7761**, **FR7762**, **FR6686** and **FR6768** to the Region L INT scheme. They have been approved with **INT** numbers **6840**, **6841**, **6842**, **6843** and **6844.** The first three have been published in 2017-18, the other two are scheduled for 2020.

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

| Scale | Produced INT charts | Planned INT charts | % |
|---|---|---|---|
| **Small (<1/1 000 000)** | 7 | 7 | 100% |
| **Medium** | **3** | 5 | **60%** |
| **Large (>1/100 000)** | 11 | 11 | 100% |
| **Total** | **19** | **23** | **83%** |

### 3.5. National paper charts

Since the last SWPHC meeting, the following national paper charts have been edited:

| National | Scale 1 : | Title | Comment |
|---|---|---|---|
| 7273 | 60 000 | De Nouméa à la Baie de Saint-Vincent | New Edition |
| 7758 | 40 000 | Îles Belep - Îles Pott et Art - Îles Daos du Nord | New Edition |
| 6658 | 50 000 | Île de Moorea - Côte Nord-Ouest de Tahiti | New Edition |
| 7355 | div | Hiva-Oa, Tahuata et Mohotani | New Edition |
| 4232 | div | Îles Australes - Île de Rapa - Îles Morotiri | Limited Edition |
| 6688 | 592 000 | Îles de la Société - De Manuae à Tahiti | Limited Edition |
| 6689 | 595 000 | Îles Tuamotu (Partie Ouest) - De Tahiti à Rangiroa et Makemo | Limited Edition |
| 6690 | 592 000 | Îles Tuamotu (partie centrale) - De Makemo à Tatakoto | Limited Edition |
| 6691 | 578 000 | Îles Tuamotu (partie Est) - De Hao à Fangataufa | Limited Edition |
| 6692 | 574 000 | Des Îles Tuamotu aux Îles Gambier | Limited Edition |

The following charts are planned to be issued in 2019/2020:

| National | Scale 1 : | Title | Comment |
|---|---|---|---|
| 7459 | div | Tikehau | New Chart |
| 7463 | 50 000 | Katiu | New Chart |
| 7757 | 20 000 | Baies de Canala et de Kouaoua | New Chart |
| 7764 | 25 000 | Abords Nord-Ouest de l'Île des Pins – Baie de Gadji et mouillage de Uapan | New Chart |
| 6282 | 30 000 | Passes entre les Iles Raiatea et Tahaa | New Edition |
| 6283 | 30 000 | Ile Tahaa | New Edition |
| 6284 | 30 000 | Partie Sud de Raiatea | New Edition |
| 7218 | 75 000 | Atolls d'Ouvéa et de Beautemps-Beaupré | New Edition |
| 5978 | div | Mer de Corail – Îles et récifs épars | New Edition |

### 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's online store http://diffusion.shom.fr under various

licenses[2] 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[3] allows unlimited 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.

### 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.

In SWPHC area, Shom has delegated its duties of national coordinator to two maritime authorities:

- in New Caledonia, to the Commandant de la zone maritime for Nouméa, with operating organism: **MRCC NOUMEA** for regions in NAVAREA X and XIV areas,
- in French Polynesia, to the Commandant de la zone maritime Polynésie française, with operating organism: **JRCC Tahiti**, for regions in NAVAREA XIV area.

Hereafter are listed the coordinates of those authorities:

| Area | Phone number | Fax number | Email address |
|---|---|---|---|
| New Caledonia | +687 292 332 | +687 292 303 | operations@mrcc.nc |
| French Polynesia | +689 40 541 615 | +689 40 423 915 | contact@jrcc.pf |

### 5.2. New infrastructure in accordance with GMDSS Master Plan

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

### 5.3. Problems encountered

NTR.

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[2] Internal reuse, commercial reuse, documentary use or end user.

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

## 6. C-55 Latest update

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

| Survey Status<br>Updated December 2018 | | Depth < 200m | | | Depth > 200m | | |
|---|---|---|---|---|---|---|---|
| | | A | B | C | A | B | C |
| L | French Polynesia | 7.5 | 16.2 | 76.3 | 13.3 | 4.8 | 81.9 |
| | New Caledonia | 7.9 | 20.6 | 71.5 | 15.5 | 2.6 | 81.9 |
| | Wallis & Futuna | 6.3 | 37.2 | 56.5 | 12.6 | 0.0 | 87.4 |

| Charting Status<br>Updated January 2019 | | Small (<1 M) | | | Medium (1M < / < 100 000) | | | Large (> 100 000) | | | Metric | WGS84 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | A | B | C | A | B | C | | |
| L | French Polynesia | 100 | 0 | 100 | 100 | 0 | 100 | 63 | 0 | 56 | 100 | 96 |
| | New Caledonia | 100 | 0 | 100 | 100 | 0 | 100 | 87 | 0 | 100 | 100 | 100 |
| | Wallis & Futuna | 100 | 0 | NA | 100 | 0 | NA | 75 | 0 | 100 | 100 | 100 |

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

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

### 7.1. Training received, needed, offered

Initial training capabilities provided by Shom include the following FIG-OHI-ACI courses: category B for hydrographic surveyors and category B for nautical cartographers. So far, those courses[4] are provided in French and are open to francophone foreign applicants.

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


*Fig.25: Courses and training provided at the Shom hydrographic school (source: shom.fr)*

[4] Training offer: http://www.shom.fr/le-shom/formation-emplois-stages/formation/
Modalities: drh-for-eco@shom.fr

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

NTR.

### 7.3. Definition of bids to IHO CB Work Programme

NTR.

## 8. Oceanographic activities

### 8.1. GEBCO/IBC's activities

On waters under French jurisdiction in the SWPHC region, Shom's bathymetric data are accessible in the form of bathymetric datasets (soundings):
http://diffusion.shom.fr/pro/amenagement/bathymetrie/lots-bathy.html

A bathymetric dataset with data collected by Shom within international waters has been transmitted to GEBCO.

### 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. Shom's own network RONIM is present in the Pacific with one station in Nouméa (New-Caledonia). 13 other tide gauges are operated and maintained by Shom under agreements with other organizations. These missions are carried out under the REFMAR programme. All real time and processed tide gauge measurements collected under that programme are freely accessible on the web http://data.shom.fr/#donnees/refmar for all areas under French jurisdiction.

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

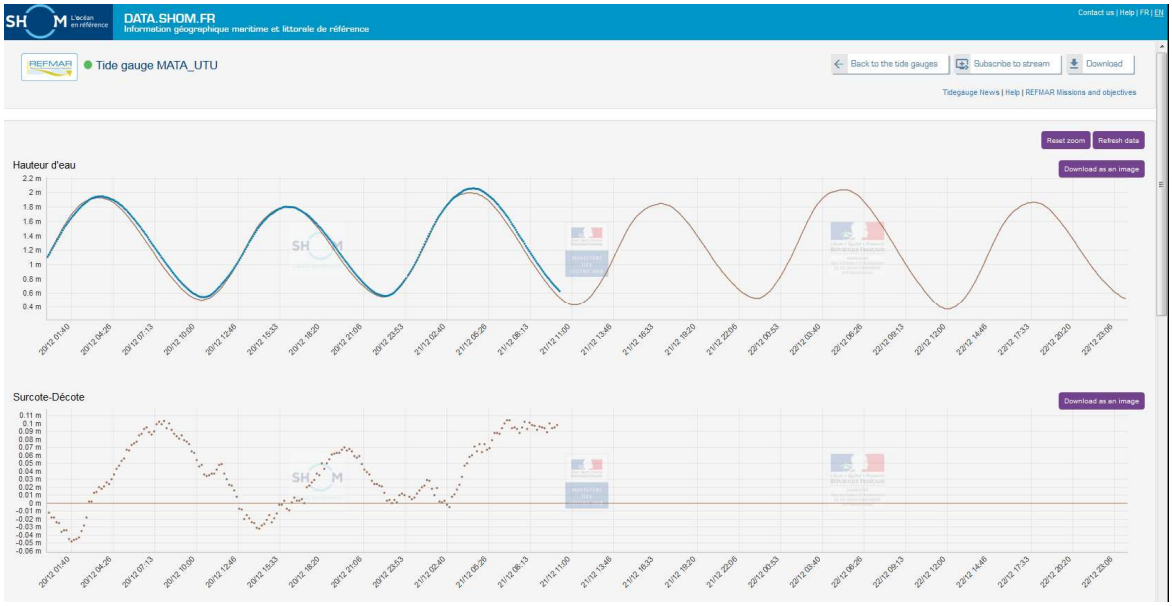


*Fig.26: Real time measurements from REFMAR tidal network on SHOM's web portal (source: data.shom.fr)*

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.

In July 2017, during the XVth GLOSS GE meeting, 3 tide gauges from the French Pacific network have been accepted in the GLOSS Core Network, which monitors sea level variation on a global scale. A formal letter has been addressed to French representative in 2018 to confirm this new status.

Since the last conference, regular or occasional maintenance interventions have been carried out on the network of tide gauges deployed in the French Pacific territories:

**New Caledonia**

Tide gauges network in New Caledonia is composed of 6 stations: Hienghène, Numbo (Nouméa), Maré, Lifou, Thio, Ouinné and Ouvéa. Maintenance operations on the existing gauges are carried on a yearly basis.

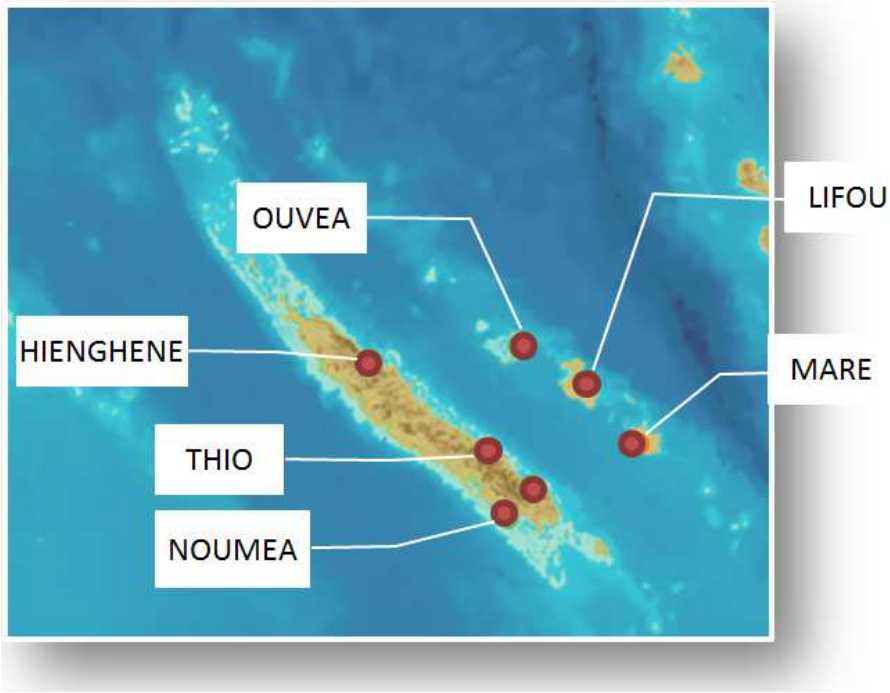


*Fig.27: Tidal gauges network covering New Caledonia.*

**French Polynesia**

Shom operates six tide gauges in French Polynesia: Vairao (Tahiti), Huaine, Rangiroa, Makemo, Rikitea and Tubuai. Maintenance operations have been limited in 2018 due to temporary funding issue. They are to restart in 2019. In early 2018 however, a composite team of Shom technicians and scientists from La Rochelle University carried a mission to audit the network and promote its interest regarding climatic research.


*Fig.28: Tidal gauges network covering French Polynesia waters.*

**Wallis & Futuna**

Futuna Island benefits from a permanent observatory since 2011. In 2014 a permanent tide gauge was also installed on Wallis Island. These stations are fitted with radar sensor, permanent GNSS and satellite real-time transmission. They are maintained on a yearly basis.

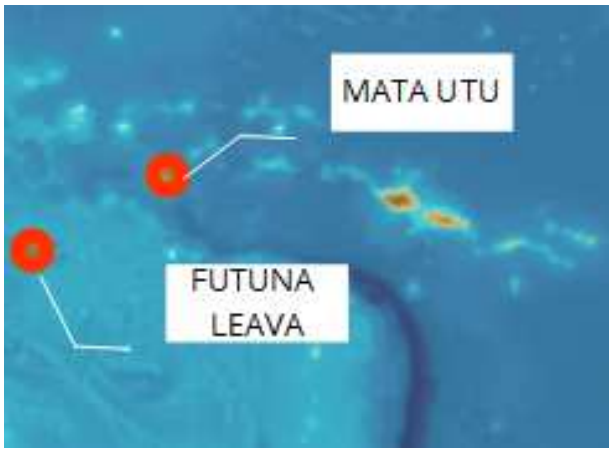


*Fig. 29: Tidal gauges in Wallis & Futuna Islands*

### 8.3. New equipment

NTR

### 8.4. Problems encountered

Distances and complex funding issues make difficult the maintenance of the French permanent sea level network in the Pacific. While uncertain in 2017 and 2018, funding for Polynesia and W&F networks have been secured for at least 3 next years.

## 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 SWPHC 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 contributes to the deployment and maintenance of most of the French sea-level stations in the Pacific. These observatories contribute to the tsunami warning system

Some of these sea-level observatories are part of the IOC GLOSS system for a global monitoring of sea level change. Nuku Hiva (Marqueses Islands), Noumea (Numbo – New Caledonia), Papeete (Tahiti) and Rikitea (Gambier Islands) are already included in the so-called "GLOSS Core Network". During the last GLOSS meeting held in New York in 2017, the assembly accepted French proposal to extend this core network with Futuna, Rangiroa, Makemo and Tubuai observatories.

In august and December 2018, two significant tsunami events hit the coast of New-Caledonia. In both cases, the tide-gauge networks proved its efficiency for real-time risk assessment and post-event analysis.

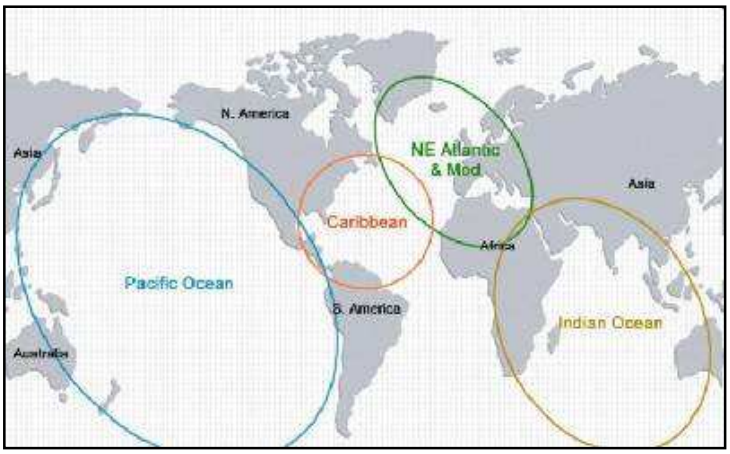


*Fig.30 : Cooperation areas on tsunami warning system (source COI; UNESCO).*

- **Coastal flooding :**

NTR.

- **Oil spills:**

NTR.

### 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
- Improved cartographic tools
- Timeline function : time synchronisation of layers to produce animated features
- New layer on administrative limits
- New bathymetric terrain models
- 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).

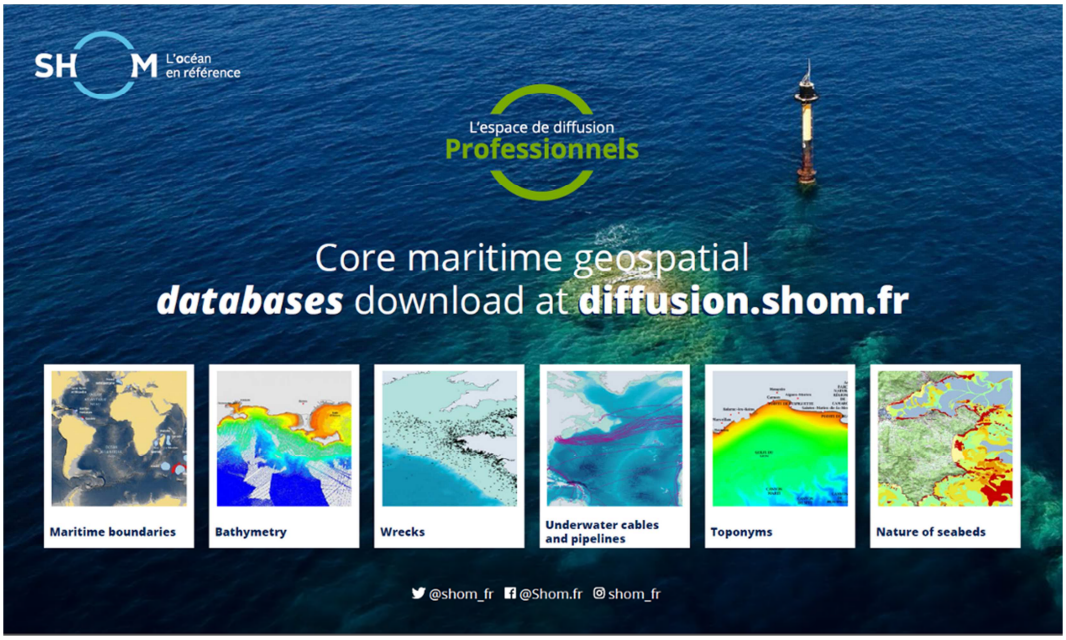


*Fig.31 : open data (diffusion.shom.fr)*

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 SWPHC region.*

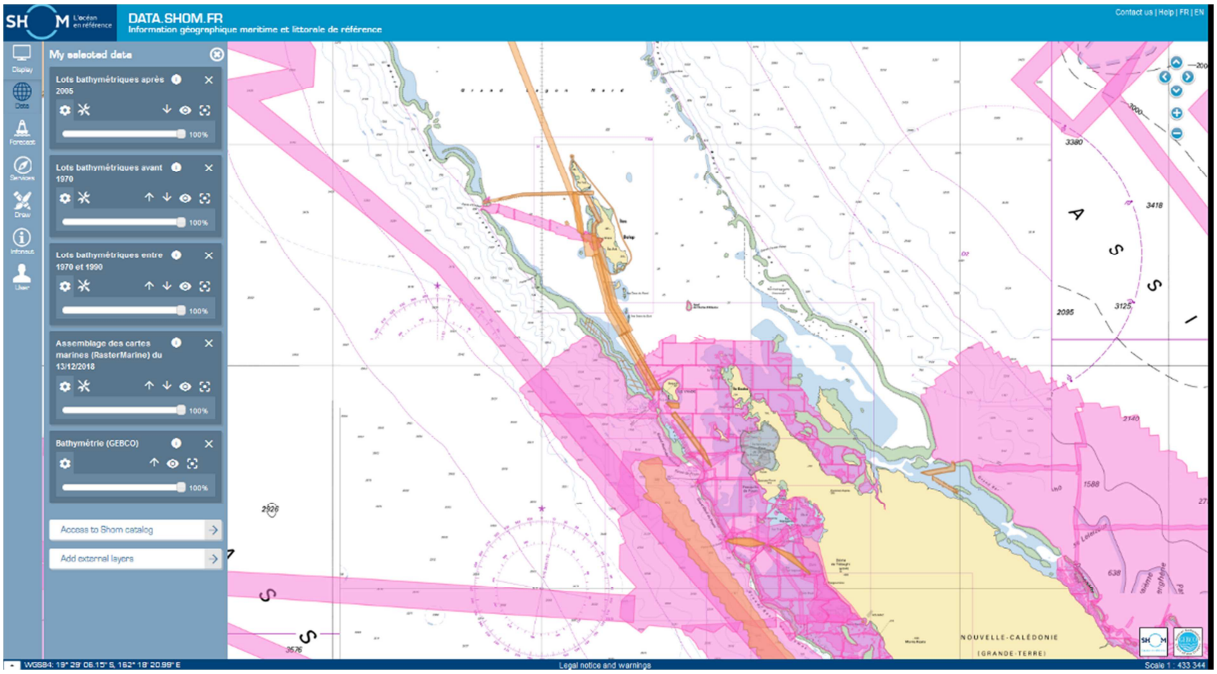


*Fig.32: bathymetric data (data.shom.fr)*

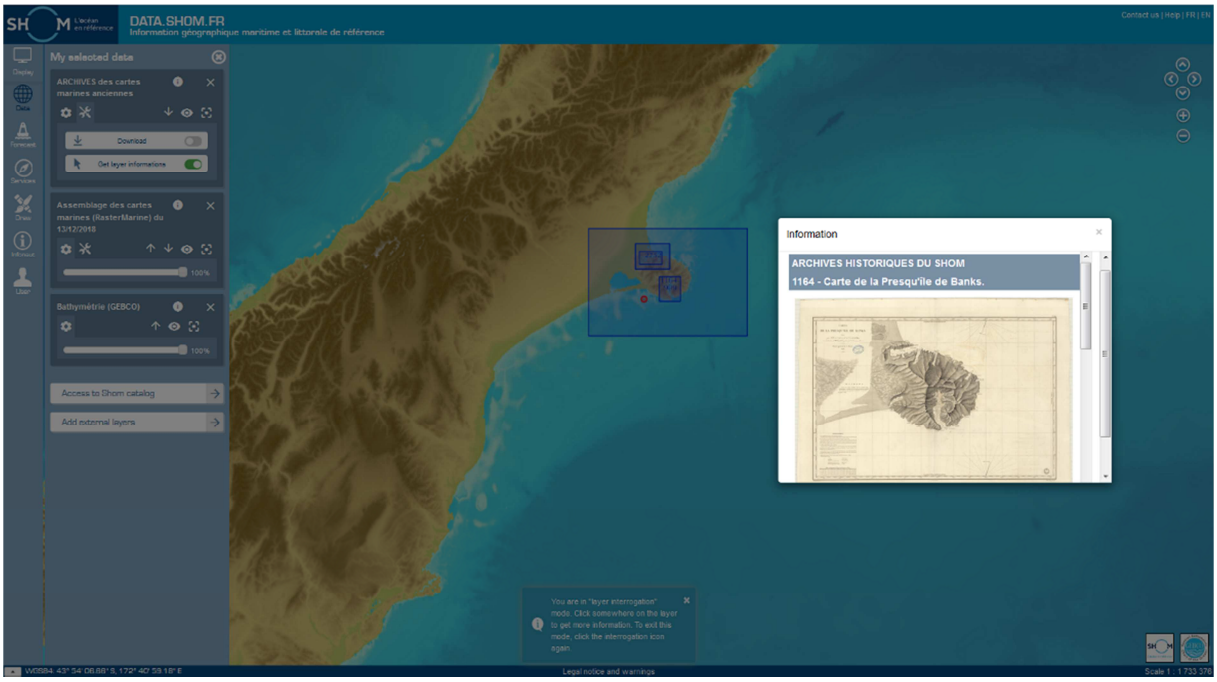


*Fig.33: Archives: nautical charts and survey fair sheets (data.shom.fr)*

On Friday 8th 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/


*Fig.34 : French maritime limits portal*

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.

### 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 | | ✓ | 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) |

## 5. 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 – GOP - Archives (DMIDSD/2.007)** |