

Direction des missions institutionnelles
et des relations internationales
Division relations extérieures

BREST, le 3 février 2022
N° 04/Shom/DMI/REX/NP

NATIONAL REPORT

SUBJET : France national report to the 19th meeting of the South-West Pacific Hydrographic Commission (SWPHC).
APPENDIX : One appendix.

1 HYDROGRAPHIC OFFICE: 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-year target and performance contract between Shom and the French State. The current target and performance contract came into effect on January 1st, 2021 for the period 2021-2024.

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 (Yearbook) has been submitted using the online system.

This national report is submitted by RDML Laurent Kerléguer, French national hydrographer and Shom Director General (laurent.kerleguer@shom.fr).

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 French Polynesia, New Caledonia and Wallis and Futuna waters and the current surveys coverage for those three areas.

Since the previous SWPHC conference in February 2021, Shom's survey unit in the Pacific Ocean, 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 recommended tracks, accesses and passages have been performed all around New-Caledonia, mainly inside the lagoon, as summarized by figure 1 and illustrated by figures 2 to 8.

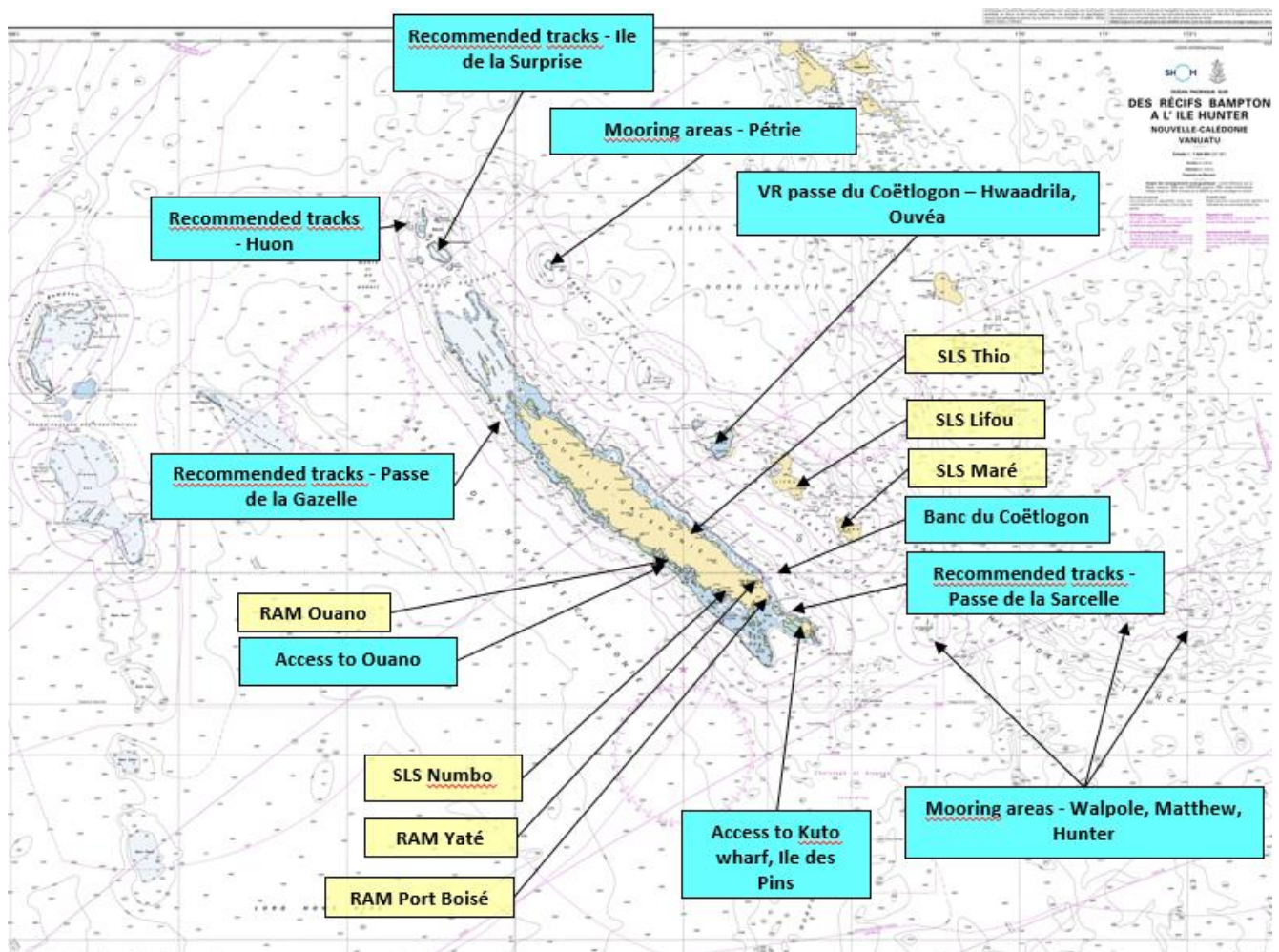


Fig. 1 – Locations of the hydrographic works realized in 2021 in New-Caledonia

- Surveys:
 - Control survey of the accesses to Ouano wharf (figure 2);
 - Opening of accesses and recommended tracks through the unsurveyed reefs: Surprise, Pétrie, Huon (figure 3);
 - Hydrographic surveys and mooring area delimitations around Matthew, Hunter and Walpole islands (figure 4);

- Opening of a new recommended track inside Ouvéa lagoon (figure 5);
- Control survey of the access to Kuto wharf (figure 6);
- Opening of a new recommended track from the Sarcelle access to Ile des Pins (figure 7);
- Opening of the recommended track from Tanlé to the Gazelle access (figure 8).

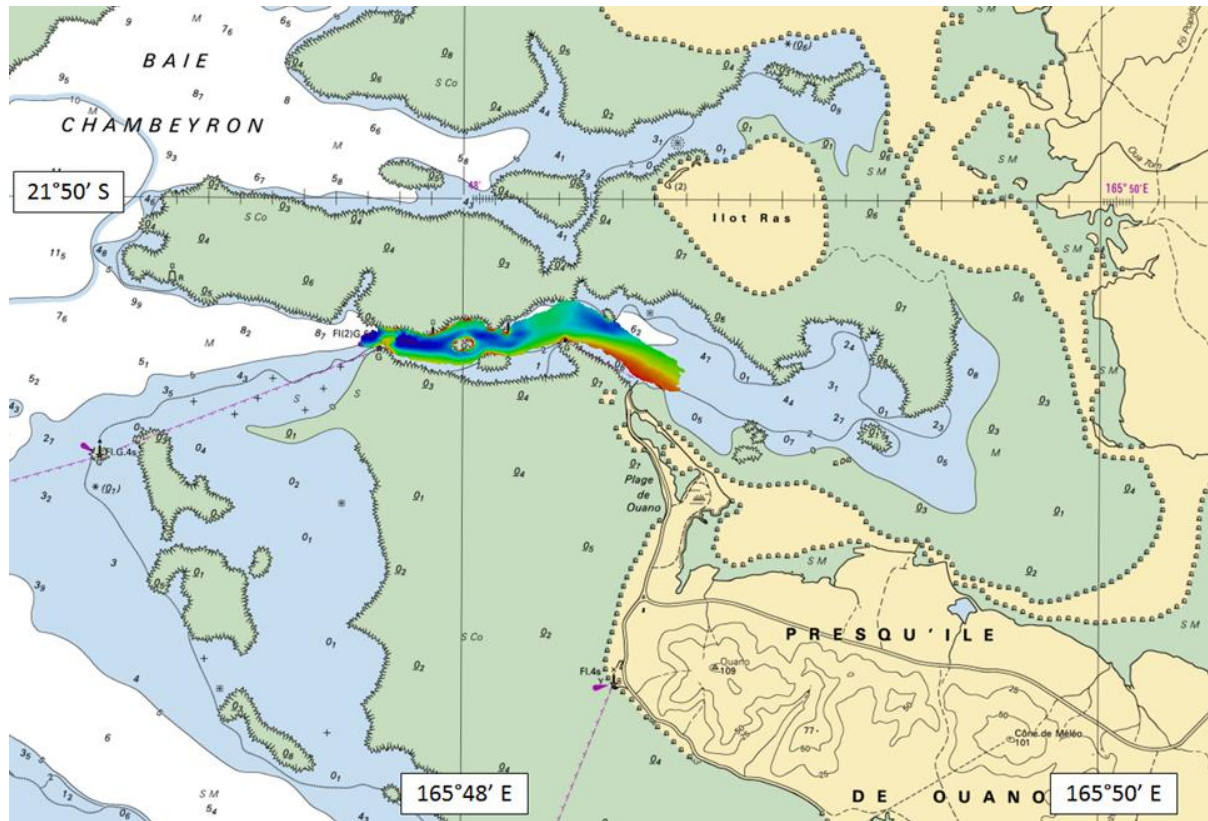


Fig. 2 – Control survey of the accesses to Ouano wharf

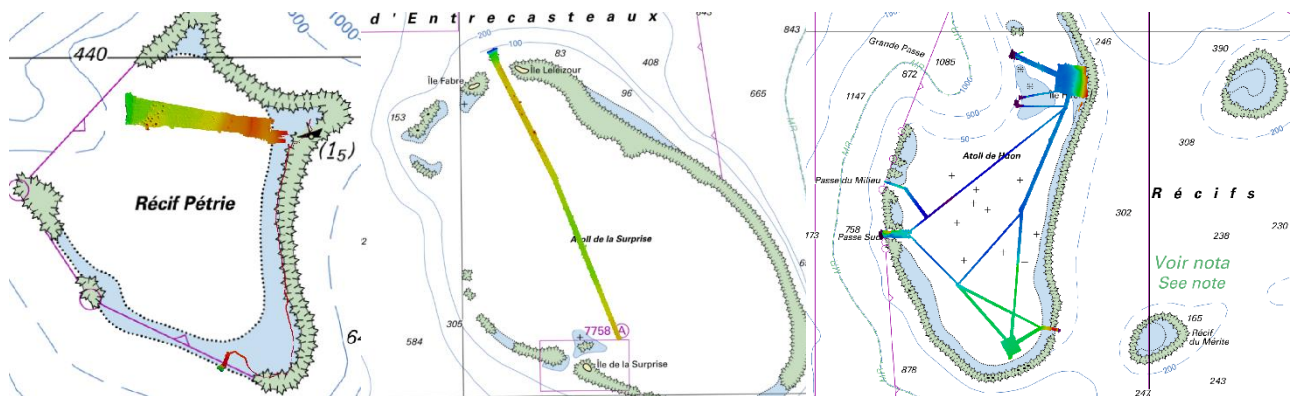
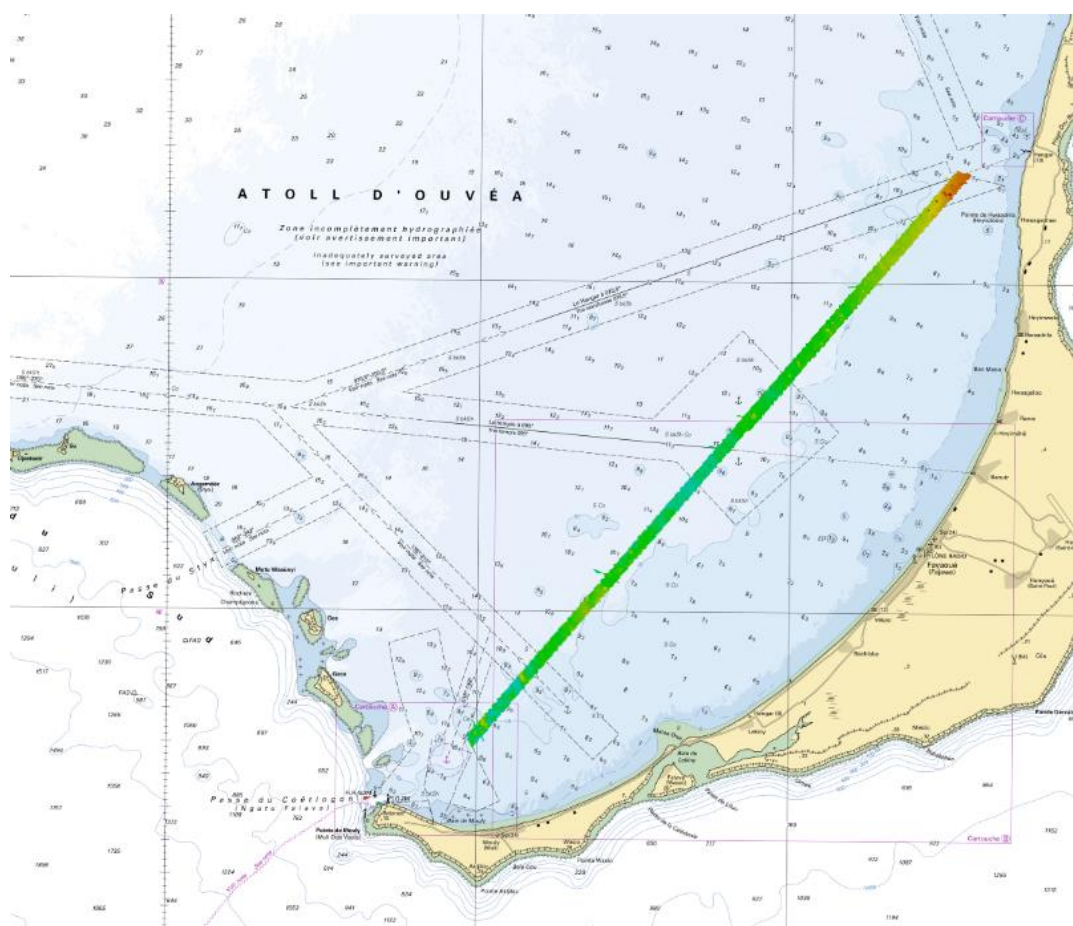
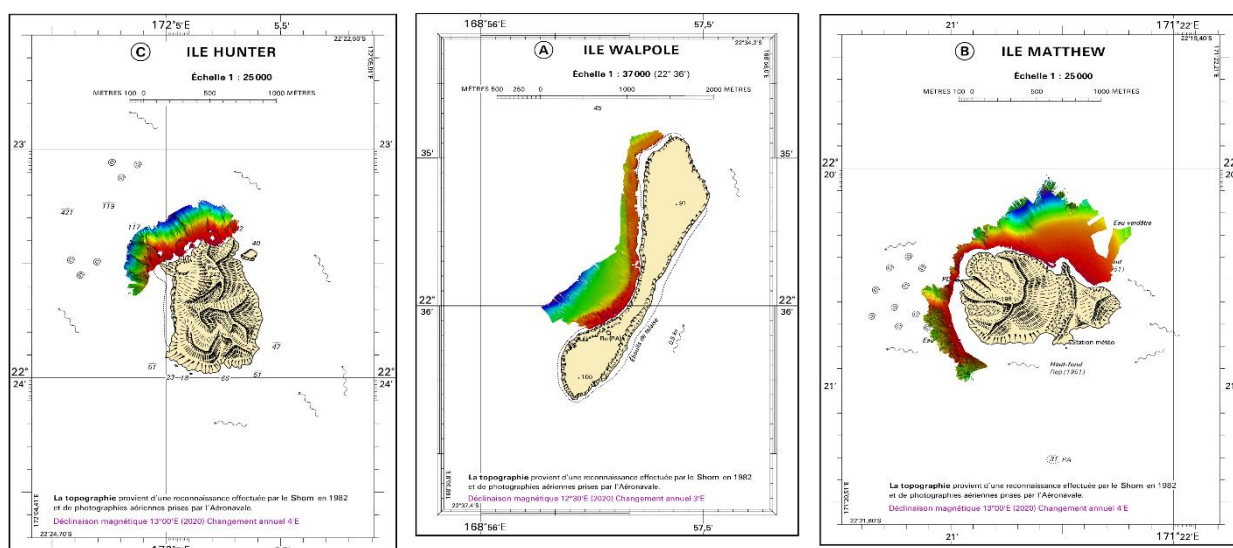


Fig. 3 – Opening of accesses and recommended tracks through the unsurveyed reefs: Surprise, Pétrie and Huon



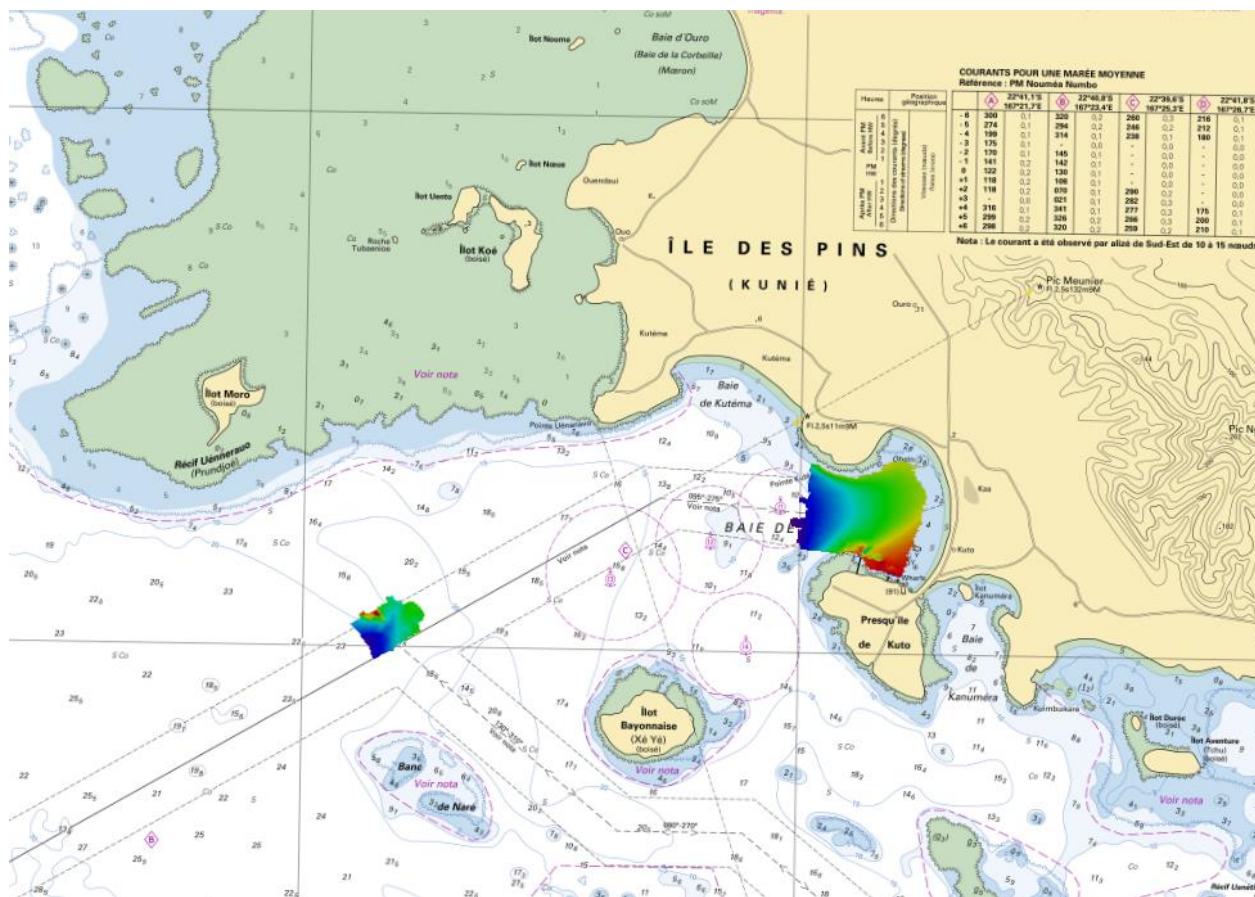


Fig. 6 – Control survey of the access to Kuto wharf

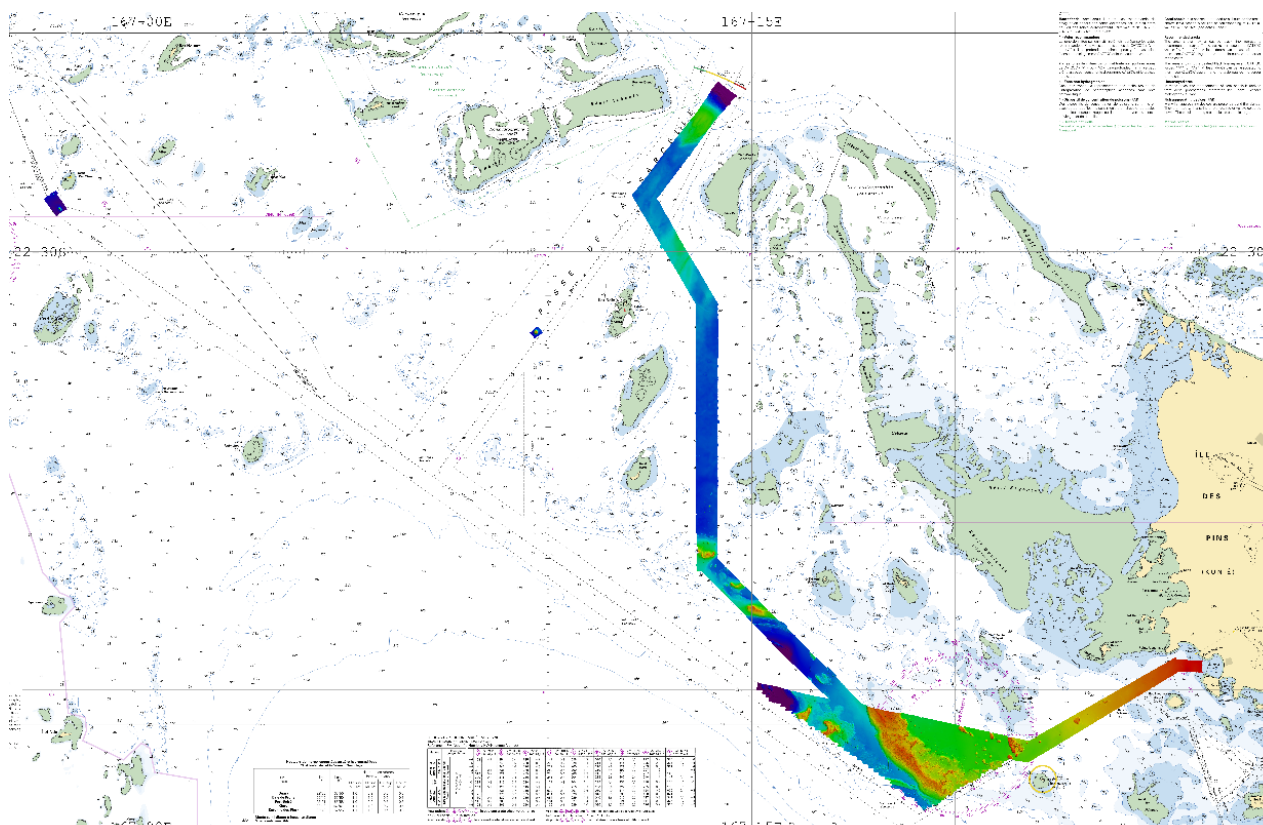


Fig. 7 – Opening of a new recommended track from the Sarcelle access to Ile des Pins

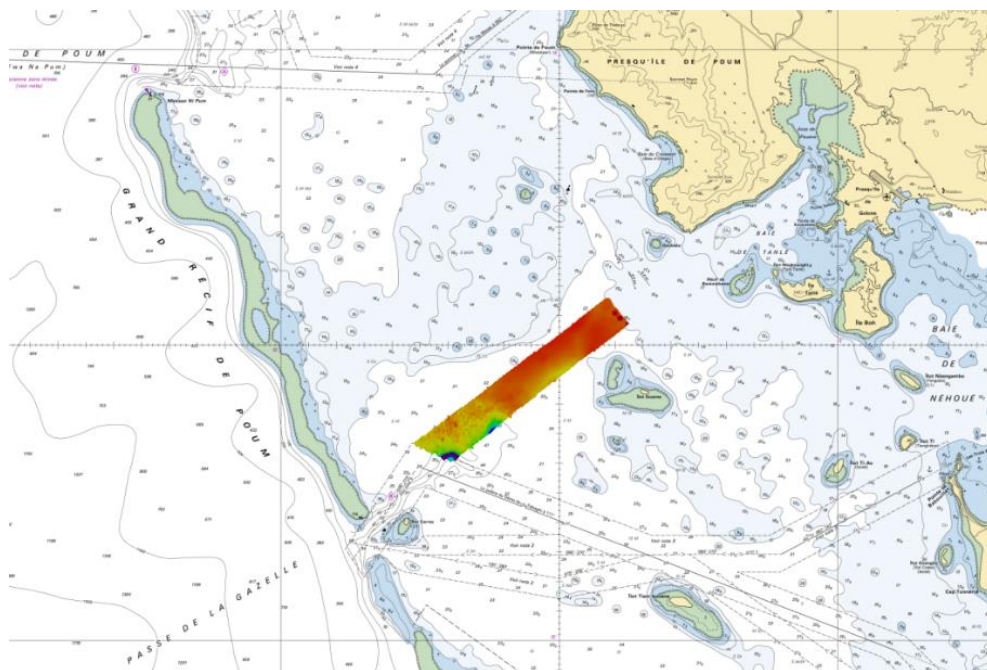


Fig. 8 – Opening of the recommended track from Tanlé to the Gazelle access

- Maintenance of Sea Level Stations (SLS) network dedicated to sea level observation and tsunamis warning system and control of tide observatories over the main island (figure 1).
- In French Polynesia:
Early in 2021, the Shom's hydrographic unit in Papeete was equipped with a new multi-beam echo sounder deployable on its motor launch and rigid inflatable boat. This reinforcement of its hydrographic capacities and the looseness of sanitary constraints allowed the team to lead several substantial surveys meanwhile the maintenance of the Sea Level Stations (SLS) continued.

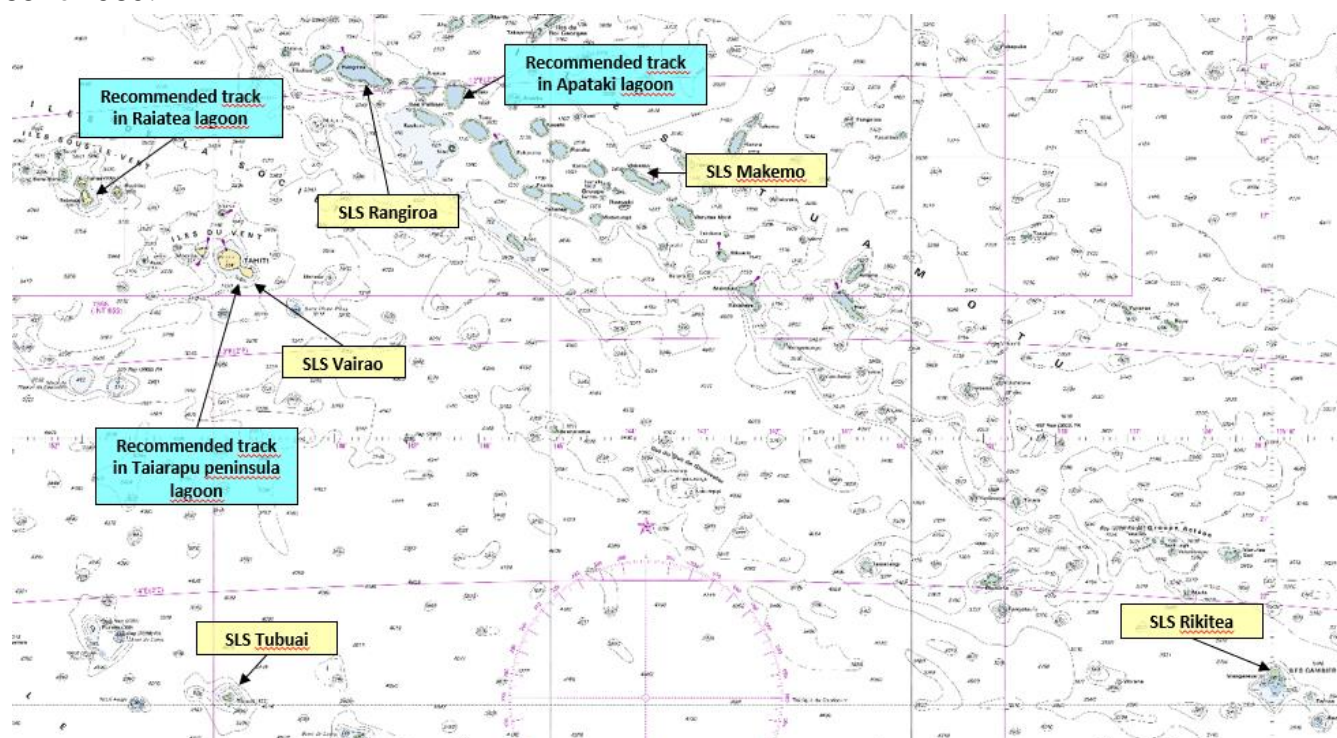


Fig. 9 – Locations of the hydrographic works realized in 2021 in French Polynesia

- Surveys:
 - Accesses and recommended tracks inside Taiarapu peninsula lagoon (figure 10);
 - Accesses and recommended tracks inside Apataki lagoon (figure 11);
 - Accesses and recommended tracks inside Raiatea lagoon (figure 12).

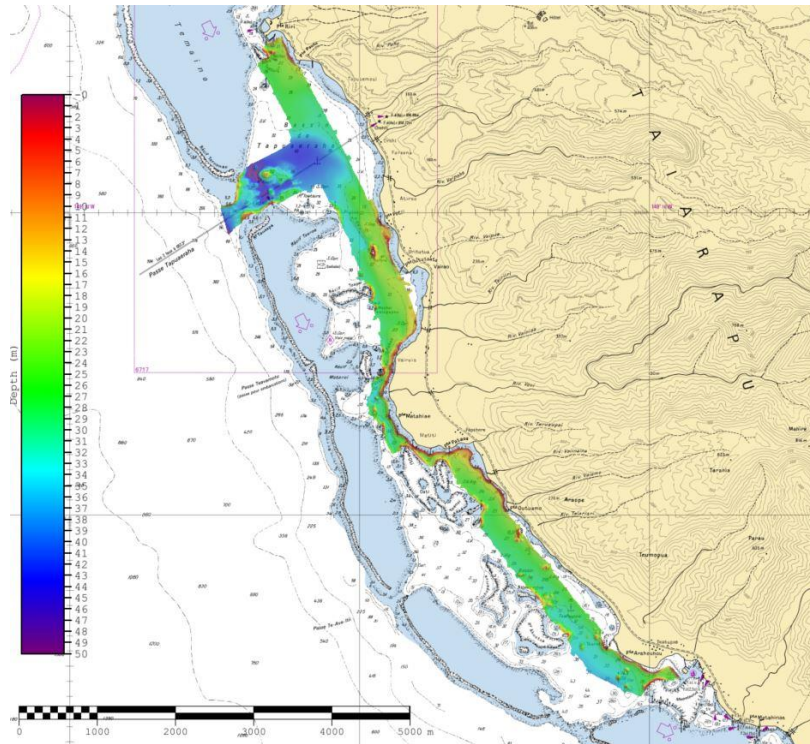


Fig. 10 – Accesses and recommended tracks inside the lagoon of Taiarapu peninsula

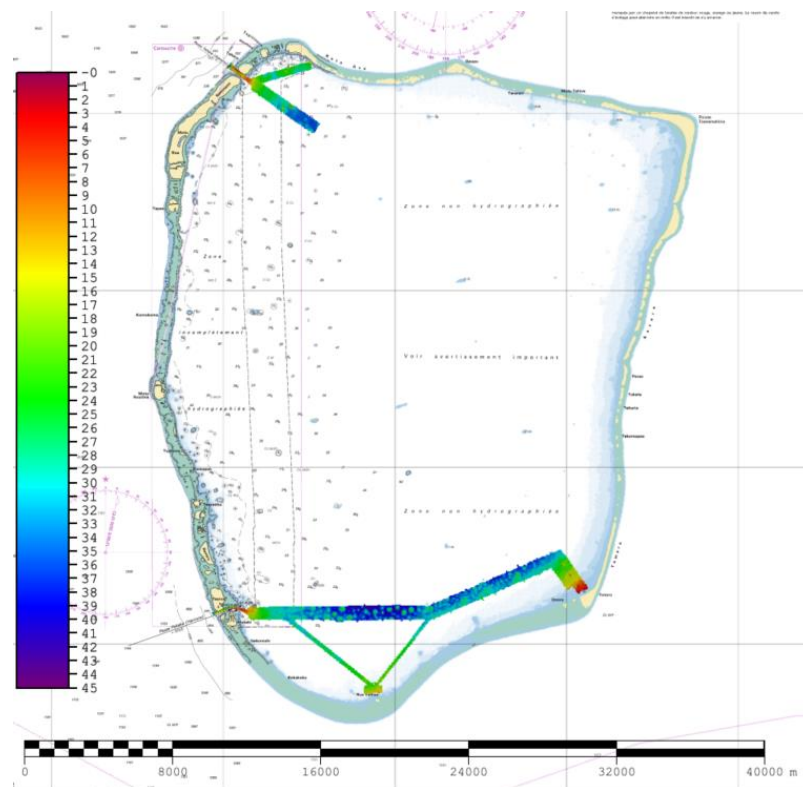


Fig. 11 – Accesses and recommended tracks inside Apataki lagoon



Fig. 12 – Accesses and recommended tracks inside Raiatea lagoon

- In Wallis & Futuna:

In 2021, due to sanitary restrictions, no action was led on the Wallis-and-Futuna territories.

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)
- diffusion.shom.fr: <http://diffusion.shom.fr/pro/risques/altimetrie-littorale.html>
 - For Tahiti (French Polynesia): <https://diffusion.shom.fr/pro/amenagement/altimetrie-littorale/lidar-polynesie-francaise-tahiti-2015.html>
 - For Moorea (French Polynesia): <https://diffusion.shom.fr/pro/amenagement/altimetrie-littorale/lidar-polynesie-francaise-moorea-2015.html>
 - For Bora Bora (French Polynesia): <https://diffusion.shom.fr/pro/amenagement/altimetrie-littorale/lidar-polynesie-francaise-borabora-2015.html>
 - For Taharuu (French Polynesia): <https://diffusion.shom.fr/pro/amenagement/altimetrie-littorale/lidar-polynesie-francaise-taharuu-2015.html>
- the open platform for French public data: data.gouv.fr

Discussions have significantly progressed with local government of French Polynesia to conduct surveys during a 3-year project starting in 2022, over an area of approximately 780 km². In particular, Shom would be part of the project as assistant project manager and would assist French Polynesia producing their coastal geographical referential. The main areas of interest are Tahiti, Tahaa, Raiatea, Huahine and Maupiti.

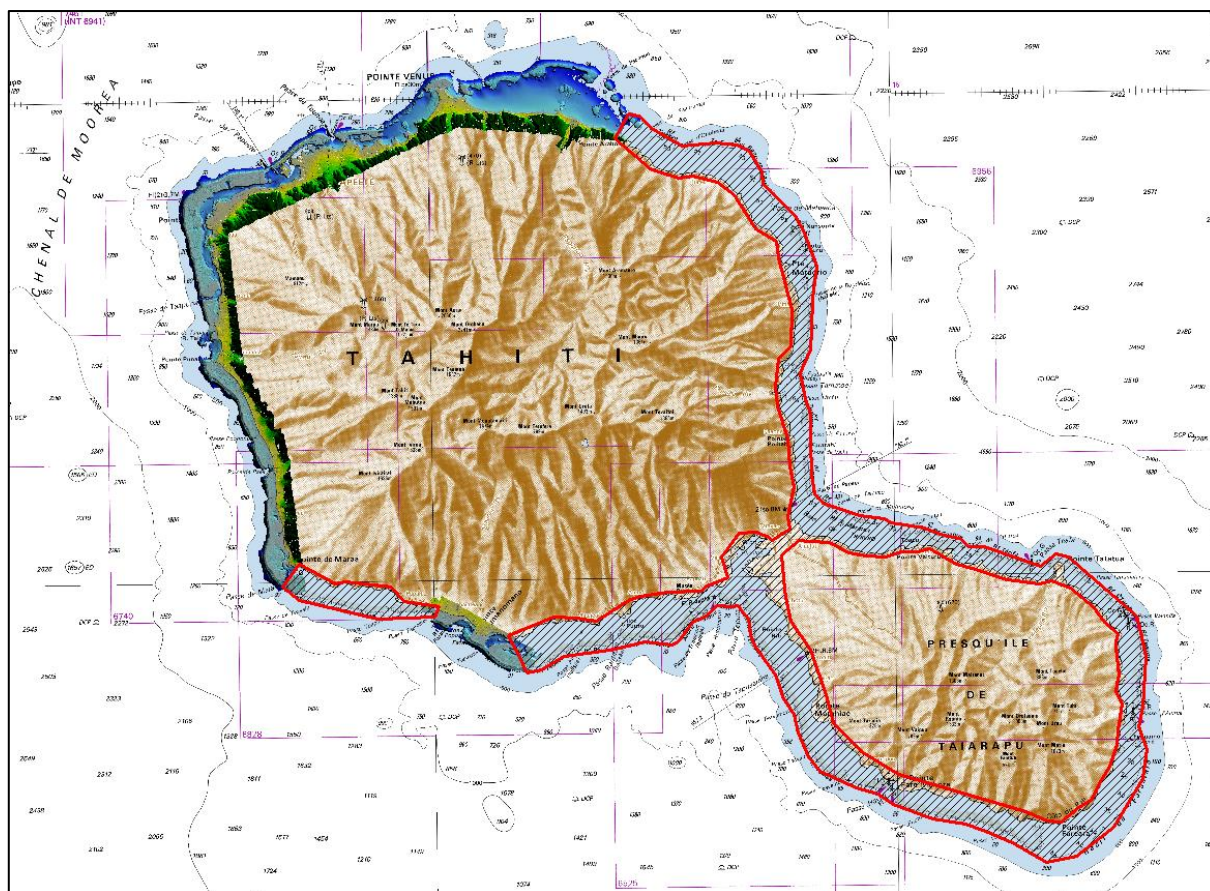


Fig. 13 – Areas of interest of the lidar surveys project in French Polynesia - Tahiti

2.3 NEW TECHNOLOGIES AND/OR EQUIPMENT

Shom's deployable hydrographic system (for rapid environmental assessment) has been upgraded with a very shallow multibeam echo-sounder (Norbit iWBMSH).



Fig. 14 – MBES Norbit iWBMSH integrated to Shom's deployable hydrographic system

See §10.1 for the preparation of future capacities.

In New Caledonia:

The use of the MBES on each vessel and the fine tuning of its acquisition parameters, has dramatically improved surveying as well as postprocessing operations efficiency.

The CUBE algorithm was used for data processing, on areas where the morphology does not include too many coral pinnacles.

In French Polynesia:

In early 2021, HSL BHPF1 was equipped with a compact shallow water multibeam echosounder (Norbit) energized through Lithium-Ion batteries. This system is fully autonomous and could be deployed on any rigid inflatable boat. Three surveys have been carried out whose impressive results are presented in Paragraph 2.1.

2.4 NEW SHIPS

NTR.

2.5 CROWDSOURCED AND SATELLITE-DERIVED BATHYMETRY - NATIONAL POLICY

Crowdsourced bathymetry – CSB

Shom translated into French the IHO publication B-12 (Edition 2.0.3), Guide on participatory bathymetry. The document is available on https://iho.int/uploads/user/pubs/bathy/B_12_Ed.2.0.3_2020-FR.pdf. France is participating in the revision of the current document.

The French national policy for crowdsourced bathymetry is currently under review.

Satellite-derived bathymetry – SDB

The satellite-derived bathymetry (SDB) has been used since 1987 by Shom to complement traditional surveys (acoustic sounding surveys) to produce nautical charts in the Pacific region (available online:

https://services.data.shom.fr/geonetwork/srv/eng/catalog.search#/metadata/TRAITEMENT_IMAGE_SPATIOCARTE_MARINE.xml).

Shom is currently conducting a research and development project in the field of SDB, Bathysat project, that will improve performance and quantify vertical uncertainties in accordance with the specifications of the new version of the S-44 (Edition 6.0.0). The results of the study should make it possible to use SDB with no need for calibration with field data.

The research part of the project has been completed last year. Results performed on different geographic areas (including an area in Pacific Ocean) have enabled to evaluate the capacity of the methods on the following objectives:

- the non-use of bathymetric measurements (to process pure remote SDB analysis);
- the accuracy of the solution faced with the seafloor complexity (reliability and limit of the parameterization of seafloor reflectance inside the model);
- the automatization and improvement of the calculation processes.

The development part will start in 2022.

2.6 CHALLENGES AND ACHIEVEMENTS

See Paragraph 2.3.

3 NEW CHARTS & UPDATES

3.1 ENC COVERAGE, GAPS AND OVERLAPS

As of 1st of January 2022, Shom has produced 798 ENCs, of which 260 ENCs within region L. The full collection should eventually reach 900 ENCs.

Since the end of 2020, the coverage in ENCs directly digitized from paper charts of New Caledonian and French Polynesian waters has been achieved. Remaining ENCs need a new edition or publication of existing paper charts.

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:

Usage Band	Produced Cells	Planned Cells	Percentage
1	1	1	100%
2	13	15	87%
3	24	24	100%
4	67	75	89%
5	87	159	97%
6	68		
Total	260	274	95%

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

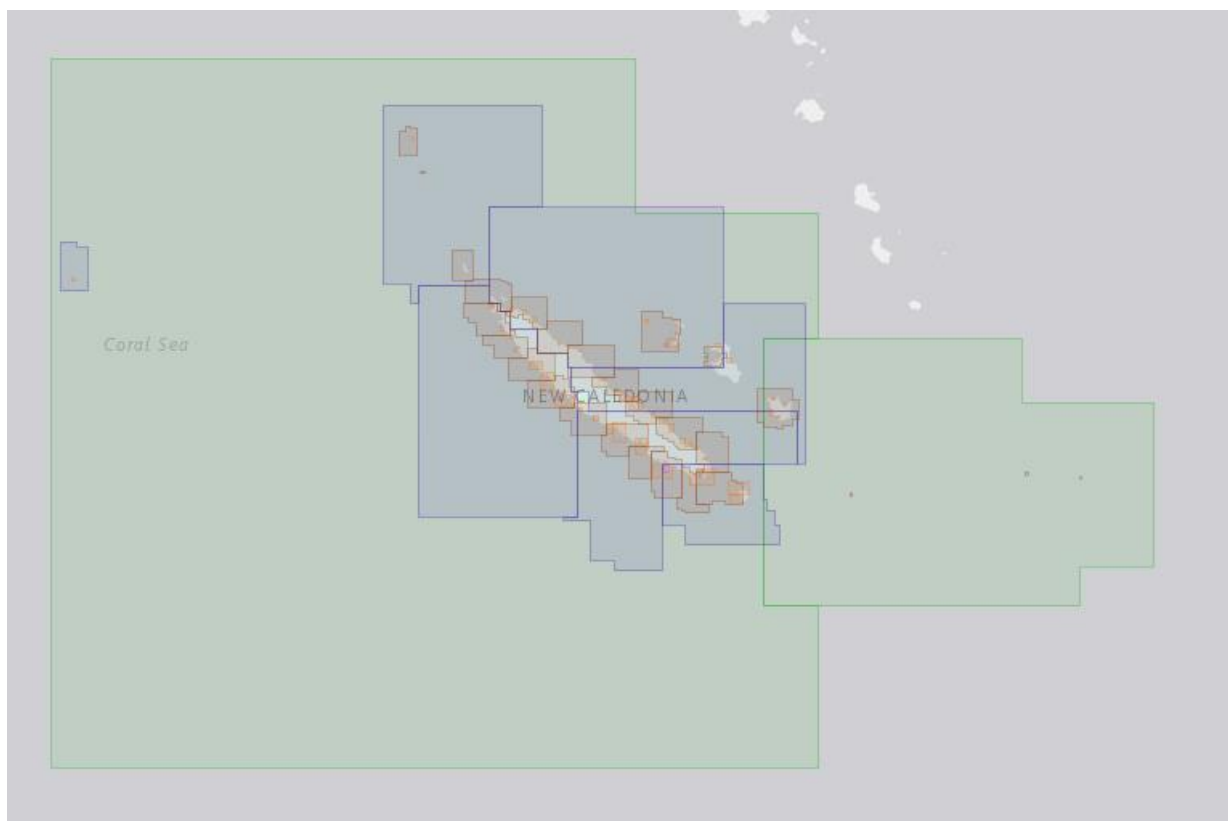


Fig. 15 - Region L - Shom's ENC production - New-Caledonia

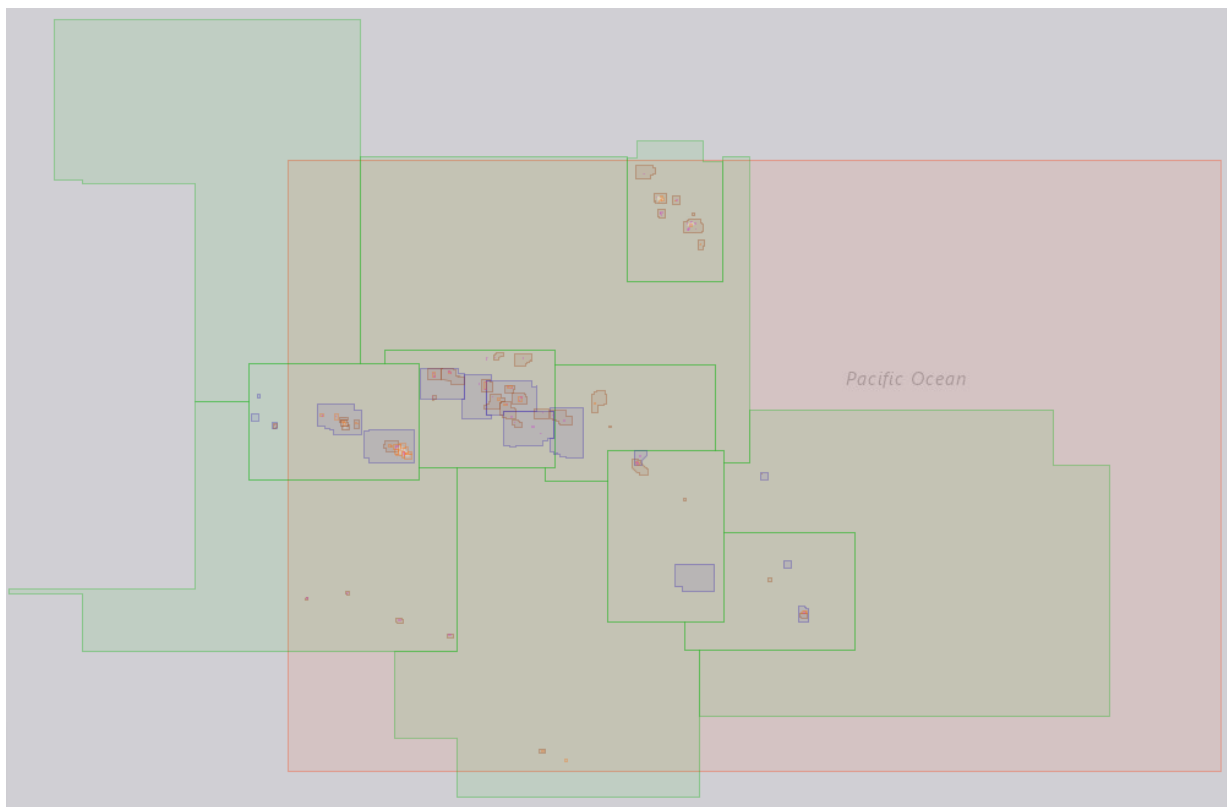


Fig. 16 - Region L - Shom's ENC production - French Polynesia

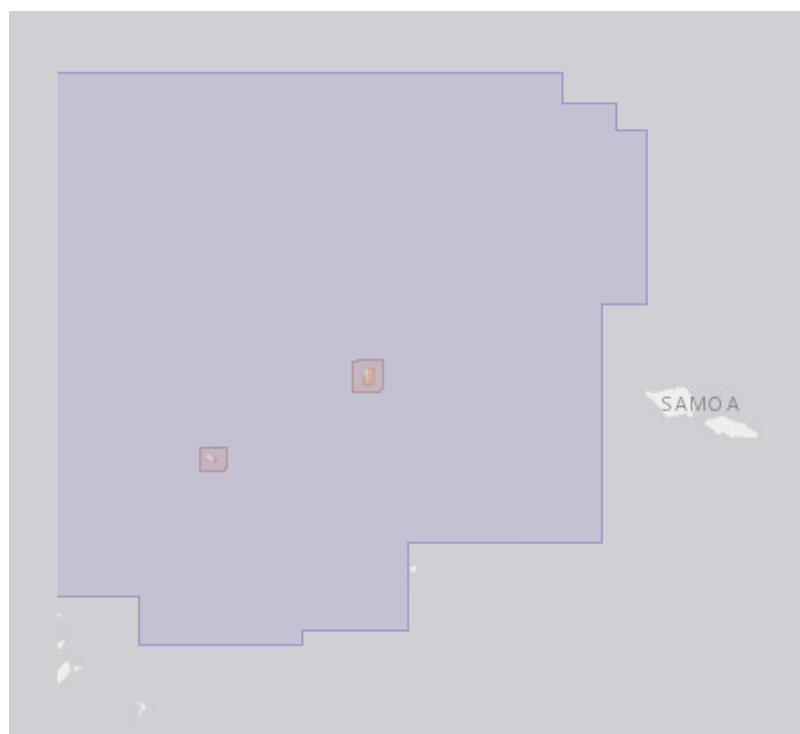


Fig. 17 - Region L - Shom's ENC production – Wallis & Futuna

ENC cells produced since the last conference are detailed hereafter:

Number	Scale 1 :	Title
FR364210	90 000	Îles Arutua, Apataki, Kaukura, Niau
FR372610	90 000	De Fakarava à Makemo
FR474630	45 000	Katiu
FR67356A	8 000	Eaio – Baie de Vaituha
FR67463A	4 000	Katui - Passe Pakata

ENC cells planned for 2022 are listed below:

Number	Scale 1:	Title
FR272680		Nouvelle-Calédonie – Îles Loyauté
FR272460		Polynésie Française
FR46279C		Maria
FR473140		Ahe
FR474620		Amanu
FR474640		Motutunga
FR474650		Tahanea
FR57757A		Baie de Kouaoua
FR57757B		Baie de Canala
FR577630		Abords Sud-Ouest de l'île des Pins – Baies de Kuto et de Kanuméra
FR67462A		Amanu - Passes
FR67464A		Motutunga – Passe Nord-Ouest
FR67465A		Tahanea - Passes Motupuapua, Teavatapu et Otao

3.2 ENC DISTRIBUTION METHOD

All French ENC (in S-63 encrypted format) are made available to distributors through the PRIMAR RENC. Shom participates, along with other hydrographic services, in the coordination work of the RENC (IC-ENC and PRIMAR).

France supports the work plan of the WEND working group to improve the implementation of the WEND principles.

3.3 RNC

NTR.

3.4 INT CHARTS

The table below contains the INT charts produced since the last conference:

INT	Scale 1:	Title	Comment
636	1 500 000	Des Récifs Bampton à l'île Hunter	FR7321 – Limited Edition
6881	60 000	De l'Île Ouen à l'Île des Pins	FR6933 – Limited Edition
6900	10 000	Port de Nouméa	FR7643 – New Edition
6955	20 000	Bora-Bora	FR7466 – Limited Edition

Besides, the following INT charts are planned for the 2022-2023 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 charts 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 2022 and 2023.

The overall INT chart production status for the region L (*changes in red*) is provided below:

Scale	Produced INT charts	Planned INT charts	Percentage
Small (<1/1 000 000)	7	7	100%
Medium	3	5	60%
Large (>1/100 000)	10	10	100%
Total	20	22	91%

3.5 NATIONAL PAPER CHARTS

Since the last SWPHC conference, the following charts have been edited:

National	Scale 1:	Title	Comment
6165	30 000	Rurutu	New Edition
6421	175 000	Îles Tuamotu - Îles Arutua, Apataki, Kaukura, Niau	New Edition
6434	30 000	Huahine	New Edition
7213	25 000	Maupiti	New Edition
7281	75 000	Hao	New Edition
7458	50 000	Aratika	New Edition
7463	50 000	Katiu	New Chart

Following charts are planned to be issued in 2022/2023:

National	Scale 1:	Title	Comment
4232	Div.	Îles Australes	New Edition
5878	Div.	Îlots dans l'archipel des Tuamotu	New Edition
6176	30 000	Maupihaa (Maupélia)	New Edition
6279	Div.	Iles Rimatara et Maria	New Edition
6282	30 000	Passes entre les Iles Raiatea et Tahaa	New edition
6283	30 000	Île Tahaa	New Edition
6604	150 000	De Mururoa à Fangataufa	New Edition
6876	20 000	Iles Wallis - Accès à Mata Utu et Halalo	New Edition
7011	60 000	De la Presqu'île Neuméni à Port-Ounia	New Edition
7314	50 000	Ahe	New Edition
7373	80 000	Rangiroa	New Edition
7462	60 000	Amanu	New Edition
7464	50 000	Motutunga	New Chart
7465	50 000	Tahanea	New Chart
7755	60 000	De Ponérihouen au Cap Dumoulin	New Edition
7757	20 000	Baie de Canala et de Kouaoua	New Chart
7763	25 000	Abords Sud-Ouest de l'île des Pins – Baies de Kuto et de Kanuméra	New Chart
7765	25 000	Abords Est de l'île des Pins – De l'île Kunumbot à l'île Nuami	New Chart

3.6 OTHER CHARTS, E.G. FOR PLEASURE CRAFT

Shom provides georeferenced marine charts in GeoTiff and S-57 format. These digital marine charts are available through Shom's online store "<http://diffusion.shom.fr>" under various licenses¹ according to the purpose of use. These data can be used with GIS or cartographic software for commercial or private purposes.

A S-57 license² allows unlimited download of updated versions for 12 months from the date of purchase.

3.7 CHALLENGES AND ACHIEVEMENTS

NTR.

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

4 NEW PUBLICATIONS & UPDATES

4.1 NEW PUBLICATIONS

NTR.

4.2 UPDATED PUBLICATIONS

Sailing directions, light and fog signal books and radio signal books are no longer published in print form. They are updated on a weekly basis and distributed via the online Shom distribution space. Mariners who subscribe to these books are alerted of corrections by e-mail and by the Notice to Mariners (GAN).

4.3 MEANS OF DELIVERY

Nautical publications are available in digital format only (pdf files) on Shom's online shop (<http://diffusion.shom.fr>).

4.4 CHALLENGES AND ACHIEVEMENTS

NTR.

5 MSI

5.1 EXISTING INFRASTRUCTURE FOR MSI DISSEMINATION

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	+687 292 121	+687 292 303	operations@mrcc.nc
French Polynesia	+689 40 541 615	+689 40 423 915	contact@jrcc.pf

MSI Point of contact at Shom:

M. Alain PAIRE
Head of Regional Team
French Hydrographic Office
13, rue du Chatellier – CS 92803 - 29228 BREST CEDEX 2 – FRANCE
Tel : + 33 (0) 256 31 23 03
email: na-om@shom.fr

5.2 STATISTICS ON WORK OF THE NATIONAL COORDINATOR

See Appendix.

Shom only plays a control and coordination role of local and coastal warnings issued by its national delegated coordinators (MRCC Nouméa and JRCC Tahiti).

5.3 NEW INFRASTRUCTURE IN ACCORDANCE WITH GMDSS MASTER PLAN

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

5.4 CHALLENGES AND ACHIEVEMENTS

NTR.

6 C-55 – LATEST UPDATES

The table with the latest information to update IHO Publication C-55 (Status of Hydrographic Surveying and Charting Worldwide) regarding region L area have been provided using the online system on 3rd January 2022:

Survey Status Updated: December 2021		Depth < 200m			Depth > 200m		
		A	B	C	A	B	C
L	France – French Polynesia	15.4	17.2	67.4	17.0	0.0	83.0
	France – New Caledonia	17.3	20.3	62.4	19.3	2.1	78.6
	France – Wallis & Futuna	17.6	30.9	51.5	20.4	0.0	79.6

Charting Status Updated: December 2021		Small (<1 M)			Medium (1M < / < 100 000)			Large (> 100 000)			Metric	WGS84
		A	B	C	A	B	C	A	B	C		
L	France – French Polynesia	100	0	100	100	0	100	75	0	95	100	100
	France – New Caledonia	100	0	100	100	0	100	92	0	100	100	100
	France – Wallis & Futuna	100	0	NA	100	0	NA	100	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

7.1 OFFER OF CAPACITY BUILDING

Shom school offers FIG-OHI-ACI (category B) courses in hydrography and marine cartography. These courses are given in French and are open to French-speaking foreign candidates (depending on available places). The training offer is presented on the Shom website:

https://www.shom.fr/sites/default/files/2020-10/Offre_formation_2020-2021_Web.pdf

Some training modules are provided within the framework of the French-speaking hydrography association (AFHy: <http://www.afhy.fr/>) and are open to its members.

A training course in hydrography accredited in category A FIG-OHI-ACI is provided by ENSTA Bretagne (<https://www.ensta-bretagne.fr/index.php/option-hyo-hydrographie-et-oceanographie/>).

SHOM L'océan en référence

TRAINING COURSES PROVIDED BY SHOM SCHOOL

	BS/L3* HYDRO*	C SYSRES-HOM	C SUP HYDRO***	NAUTICAL CARTOGRAPHER TRAINING COURSE*
Average number of students	2 to 8 petty officers/ 2 foreign students/10 students UBO	2 to 5 hydrographers petty officers	2 to 5 hydrographers petty officers	2 to 8 trainees
Duration	14 months	9 months	4 months	9 months
Admission	based on application file	based on application file	based on application file	based on diplomas or competitive exam
Curriculum	<ul style="list-style-type: none"> manœuvre and navigation Training specific course on hydrography and oceanography on board end-study project 	<ul style="list-style-type: none"> information technology theoretical and practical training (application to hydrography IT) Practical internships in SHOM IT department and survey unit (GHOA) 	<ul style="list-style-type: none"> advanced technical training on hydrography team management training 	<ul style="list-style-type: none"> general training on hydrography and geosciences specific training on nautical cartography end-study technical project

* Formation carried out in partnership with the UBO, its validation allows you to obtain a bachelor's degree.
 ** Recognized training course in category A held by FIG-OHI-ACI International board.
 *** Title of "Hydrographic Supervisor" registered in the RNCP and certified at level 3 (master's degree).

SHOM school support to L'ENSTA Bretagne

	HYDROGRAPHIC ENGINEER**
Average number of students	36 months (+12 months for French military students)
Duration	based on diplomas or competitive exam
Admission	see: www.ensta-bretagne.fr
Curriculum	

Logique : ENSTA : Ecole Supérieure des Techniciens Supérieurs - RNCP : Répertoire National de la Certification Professionnelle - Cti : Commission des Titres d'Ingénieurs - FIG-OHI-ACI : Fédération Internationale des Géomètres - Organisation Hydrographique Internationale - Association Cartographique Internationale - ICA : International Cartographic Association - CNP : Commission Nationale de la Certification Professionnelle - ENSTA : Ecole Supérieure des Techniciens Supérieurs - RNCP : Répertoire National de la Certification Professionnelle - Cti : Commission des Titres d'Ingénieurs - FIG-OHI-ACI : Fédération Internationale des Géomètres - Organisation Hydrographique Internationale - Association Cartographique Internationale - ICA : International Cartographic Association - CNP : Commission Nationale de la Certification Professionnelle

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

Fig. 18 – Courses and training provided at the Shom hydrographic school (source: shom.fr)

7.2 TRAINING RECEIVED, NEEDED, OFFERED

NTR.

7.3 PROJECT MANAGEMENT ASSISTANCE FOR THE CONSTRUCTION OF HYDRO-OCEANOGRAPHIC VESSELS

Shom has a recognized know-how in the construction of hydro-oceanographic vessels (from 8m launches to 100m vessels). It masters the entire process from the expression of needs to the implementation of systems. It puts its expertise at the service of shipyards, within the framework of new constructions or modernizations for:

- Studies to define, on the basis of an expression of need, the complete specifications in terms of hydro-oceanographic equipment (including computers), as well as the fitting out of premises and scientific spaces of hydro-oceanographic ships. Shom provides intellectual services such as the drafting of the metrological survey essential to the proper integration and control of the systems, the specification of the batches of spare parts adapted to the ship's missions, the interface plans, the acceptance book and the ship's logbook (in its field of competence).
- Equipment acceptance and integration: supervision of equipment integration (mechanical, interfacing, metrology, etc.), acceptance tests in the factory, in port and at sea.

- Training and assistance: training of personnel who will implement the equipment, but also of personnel who will maintain the systems, transfer of skills, handling of warranty calls after delivery of the vessel to the end customer.



Fig. 19 – Nigerian hydrographic ship Lana built by the French shipyard OCEA with the support of Shom (Source: OCEA)

7.4 STATUS OF NATIONAL, BILATERAL, MULTILATERAL OR REGIONAL DEVELOPMENT PROJECTS WITH HYDROGRAPHIC COMPONENT

NTR.

7.5 DEFINITION OF PROPOSALS AND REQUESTS TO THE IHO CBSC

NTR.

8 OCEANOGRAPHIC ACTIVITIES

8.1 GENERAL

NTR.

8.2 GEBCO/IBC'S ACTIVITIES

In the waters under French jurisdiction of the SWPHC region, Shom's bathymetric data are accessible:

- through the *EMODnet Bathymetry* portal (<http://www.emodnet-bathymetry.eu/>)
- in the form of bathymetric DTMs for the coastline and the shoreline on Shom's dissemination space (<http://diffusion.shom.fr/pro/risques/bathymetrie.html?p=1>)
- as bathymetric batches on Shom's dissemination space (<http://diffusion.shom.fr/pro/amenagement/bathymetrie/lots-bathy.html>)

Data on transits in French and international waters were provided to IHO DCDB and for integration into the GEBCO grid in 2018.

The survey coverage and associated metadata available on the IHO DCDB site are provided via the *EMODnet Bathymetry* portal supported by the European Union. The last update of all these bathymetric resources was performed in December 2020.

8.3 TIDE GAUGE NETWORK

Shom is the national coordinator and reference authority for the observation of the sea level, managing and issuing the resulting data. This mission is 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. Shom itself operates and maintains a large tidal network reporting in real time, RONIM, which is a major contribution to REFMAR.

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

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.

The maintenance operations are funded on a 5 years basis. The rhythm of operations is about 18 months.

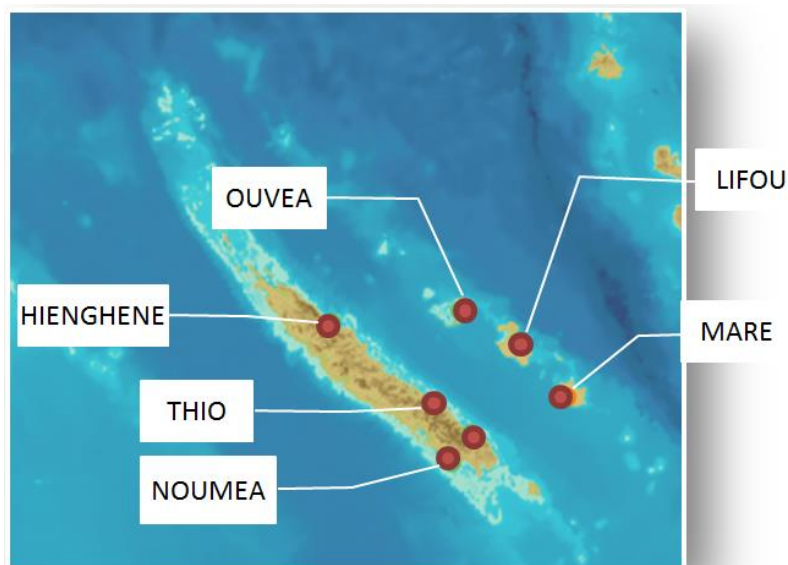


Fig. 20 – Tidal gauges network covering New Caledonia waters

French Polynesia:

Shom operates six tide gauges in French Polynesia: Vairao (Tahiti), Huahine, Rangiroa, Makemo, Rikitea and Tubuai.

A new convention with local authorities was signed in 2021, for 6 years, leading to an 18-month cycle for maintenance operations on each observatory.

Rangiroa observatory was dismantled due to rebuilding of the wharf. It should be installed again when construction is done.

Meanwhile, a new observatory in Ua Pou island (Marquises archipelago) is being studied.



Fig. 21 – Tidal gauges network covering New Caledonia French Polynesia waters

Wallis & Futuna:

A new convention with local authorities was signed in 2021, for 5 years, leading to an 18-month cycle for maintenance operations on each observatory.

Due to the sanitary constraints, none of the in-site maintenance was led in 2021. They are postponed to early 2022.



Fig. 22 – Tidal gauges network covering Wallis and Futuna waters

8.4 NEW EQUIPMENT

The COVID-19 crisis delayed Shom's project of a convergence on a similar hardware standard for SLS in metropolitan France and in the Pacific. The renewal of data loggers, transmission equipments and supervision software and some compatibility tests with the radar sensor are being run in Brest and Papeete. The expected results are: a better reliability, improved transmission rates and lower maintenance requirements. It is expected that tide gauges in New-Caledonia and Wallis & Futuna will benefit from these improvements in 2022/2023.

8.5 CHALLENGES AND ACHIEVEMENTS

One of the main challenges for GOP in the coming 2 years will be the upgrade of the sea level observation network through the Pacific Ocean. The action is lead through a Shom's strategic program and the deployment should start in 2022 in the Pacific. For the GOP's unit, 2021 was dedicated to local tests of new sensors (radars and pressure sensors) and new communication systems in part to prepare the future upgrade.

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

In addition, local authorities manage MSDI portals:

- New Caledonia: <https://georep.nc/>
- French Polynesia: <https://www.tefenua.gov.pf/>

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

Shom contributes to the IHO MSDIWG.

The head of GOP is the French representative in the SWPHC MSDIWG.

9.4 NATIONAL IMPLEMENTATION OF THE SHARED DATA PRINCIPLES – INCLUDING ANY NATIONAL DATA POLICY AND IMPACT ON MARINE DATA

In accordance with France open data policy, Shom has opened access to its basic data: bathymetric data, wrecks, cables, seabed types, maritime limits & boundaries, toponymic databases, port information, and maritime regulations, etc. are distributed under a Creative Commons "CC-BY-SA 4.0" license or an open license, depending on the case.

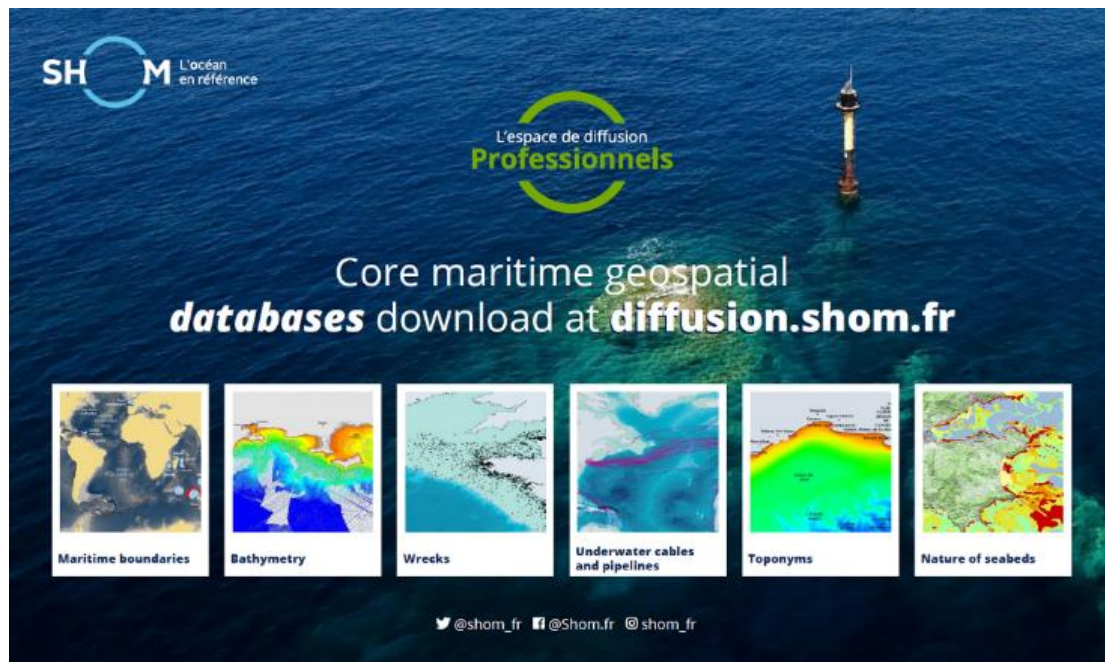


Fig. 23 - Access to Shom's open data (diffusion.shom.fr)

9.5 MSDI NATIONAL PORTALS

Data available on data.shom.fr portal are organised according to the following topics:

- Master data: cartography, maritime boundaries, maritime and coastal database, coastal altimetry, bathymetry, vertical datums, sedimentology, geophysics, tides, currents and historical data;
 - Oceanographic forecasts: waves, meteorology, water level, hourly surface hydrodynamic, daily mean 3D hydrodynamic and oceanogram;
 - Coastal observations: sea level (REFMAR), sea surface current and sea bottom turbidity.
- Not all this information is available on the SWPHC region.

Hereafter are listed some of the latest evolutions:

- Wrecks and obstructions (edition);
- Port information (new layer);
- Regulation – Navigation (new layer);
- Search and rescue areas (new layer);
- Bathymetric digital elevation model – New-Caledonia (new layer);
- Outer limit of the territorial sea and outer limit of the exclusive economic zone off French Polynesia (new data);
- Worldwide sediments map (edition);
- New tools and services (<https://services.data.shom.fr/support/fr>);
- New ergonomics of data.shom.fr portal (see next chapter);
- Redesigned drawing tool.

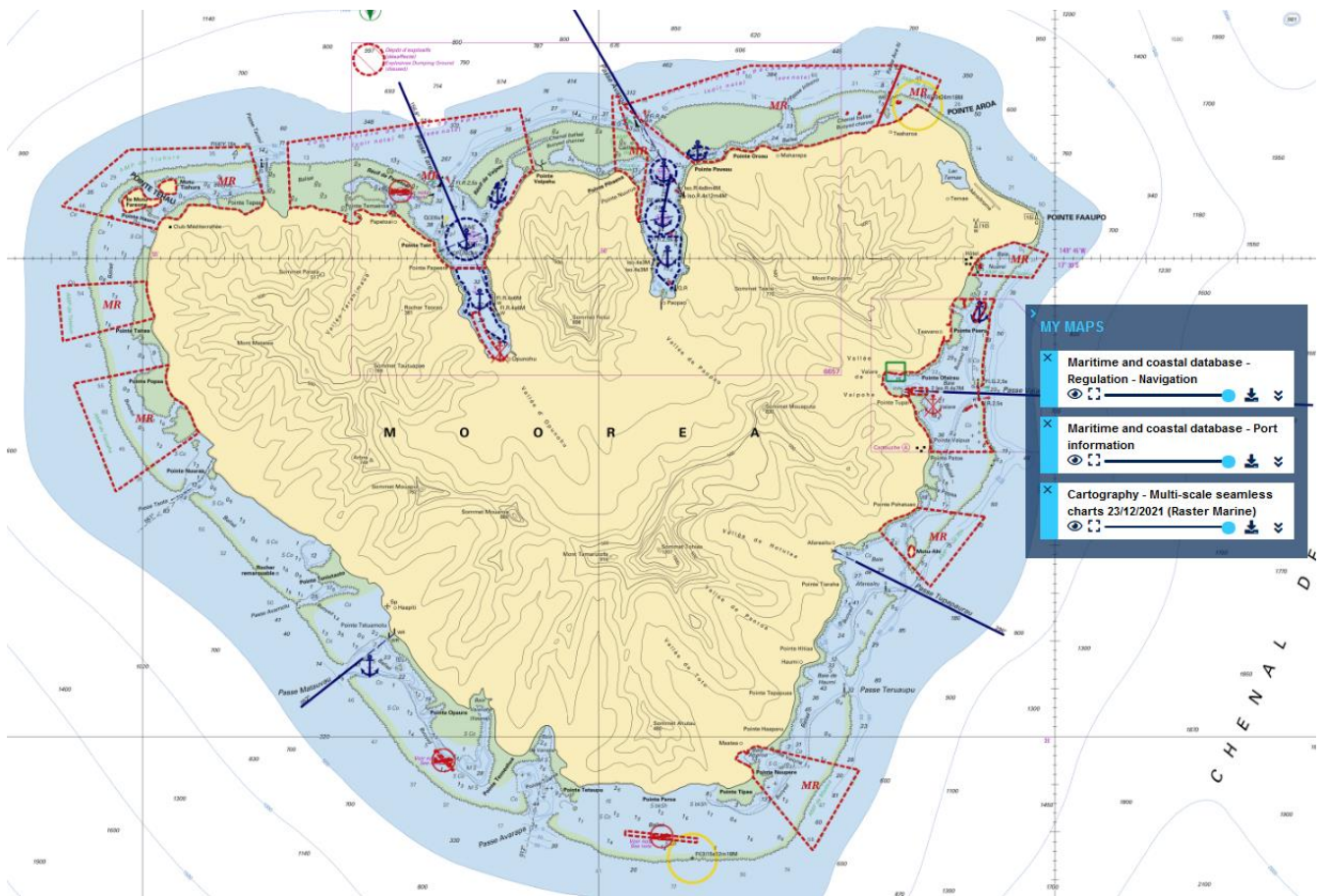


Fig. 24 - New layers: Port information & Regulation - Navigation (data.shom.fr)

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>).

9.6 BEST PRACTICES AND LESSONS LEARNED

Between July 2019 and June 2020, a UX designer from the "designers of general interest" (DIG) program supported by the French interdepartmental digital direction (DINUM) was tasked with improving the user experience of dissemination portals including data.shom.fr. Based on feedback from portal users, a new portal ergonomics with, in particular, a more prominent cartography and a redesigned drawing tool has been defined. This new portal was put online at the beginning of June 2021.

Among the new features of this new version of data.shom.fr:

- A more fluid interface with repositionable windows;
- A redesigned drawing tool to facilitate its use;
- The "Ocean Forecast" tab restructured;
- A redesigned catalogue of available layers;
- New measurement tools: surface calculation and azimuth distance;
- A complete version in English.

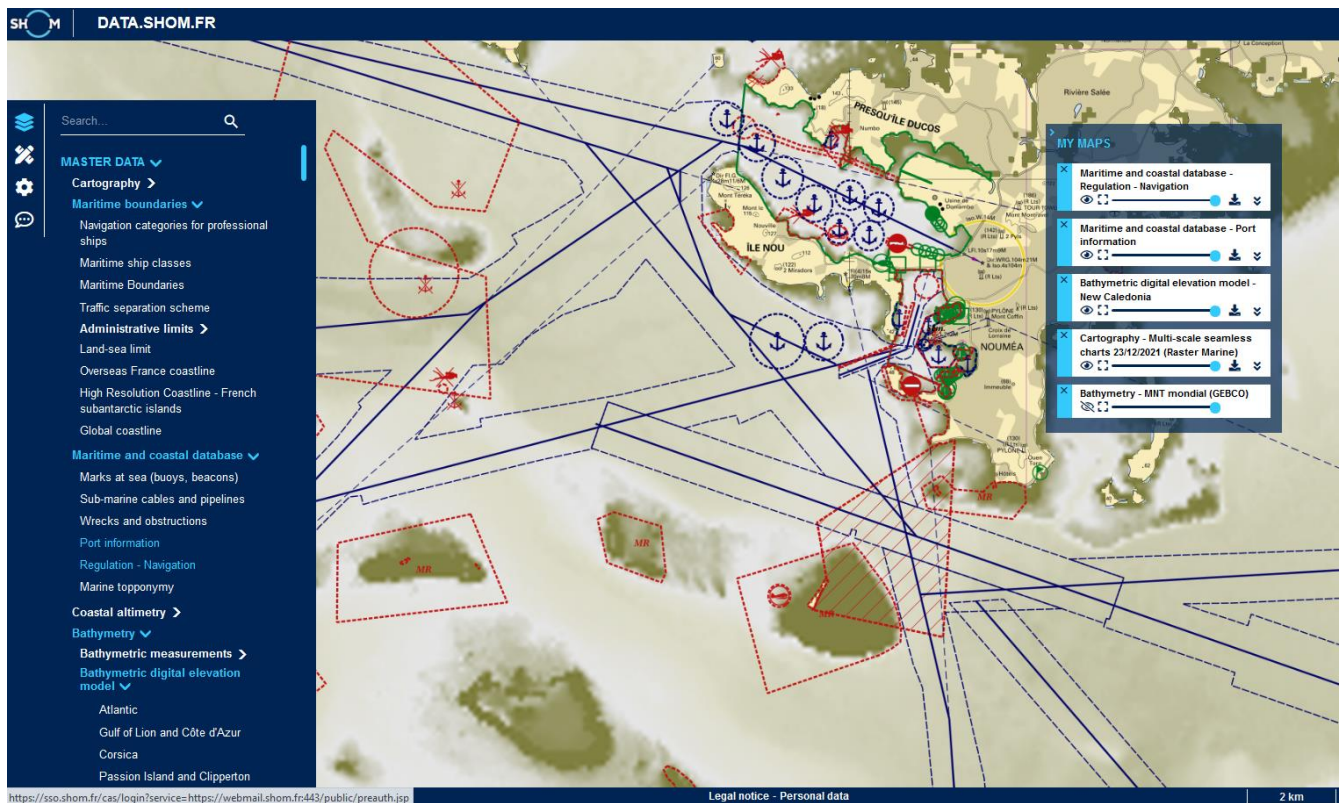


Fig. 25 - New ergonomics of Shom's maritime geographic information portal (data.shom.fr)

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 2 Unmanned Surface Vehicles DriX from iXblue; many other experiments were carried out in 2021: in January with Autonomous Underwater Vehicle Gavia from Teledyne; in May and June with USV Inspector and AUV A18D from ECA; in August with 2 gliders Sea Explorer from Alseamar and a last one in October with deep sea AUV HUGIN Superior from Kongsberg Maritimes. Other experiments are planned in 2022 and in the coming years. 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.



Fig. 26 - Experiment of USV DriX deployed from BHO Beautemps-Beaupré (Source: iXblue, 2020)



Fig. 27 - Experiment of AUV HUGIN deployed from BHO Beautemps-Beaupré (Source: Marine nationale, 2021)

10.2 RISK ASSESSMENT

Shom completed in 2020 the development of an experimental tool called "Deseason platform". It is a multi-criteria decision tool for hydrographic risk assessment and cost-benefit analysis. It will be used in the coming years to improve the national hydrographic survey program.

10.3 POLICY MATTERS

NTR.

11 OTHER ACTIVITIES

11.1 PARTICIPATION OF 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
HSWG		✓	Hydrographic Surveys Working Group
SWPHC		✓	South-West Pacific Hydrographic Commission
TWCWG	✓	✓	Tidal, Water Level and Currents Working Group
WEND		✓	World-Wide Electronic Navigational Chart Database
WWNWS		✓	World-wide Navigational Warning Service Sub-Committee

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 MACHC 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 alert

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.

Futuna (Wallis&Futuna), Papeete, Rikitea, Rangiroa, Makemo, Tubuai, Nuku Hiva (French Polynesia), and Noumea (Nouméa – New Caledonia) observatories are already included in the so-called “GLOSS Core Network”.



Fig. 28 - Cooperation areas on tsunami warning system (source COI; UNESCO)

- Coastal flooding

Shom is not currently working on the development of coastal flooding forecast capabilities the French Pacific territories but recently started contacts with Météo-France to make multi-resolution bathymetric digital elevation models over French Polynesia, that meet the requirements for the implementation of storm surge and wave coastal models.

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

NTR.

12 CONCLUSIONS

a) Areas of significant achievement

Despite the sanitary crisis, Shom coped to lead several MBES bathymetric surveys over French Polynesia and New-Caledonia. Confinement period were dedicated to data processing and preparation of the planned missions. Therefore, the operational calendar was roughly respected.

This amount of missions, coupled to the scope of action of the new systems, give the excellent results gathered by the GOP units in 2021. Moreover, the quality of the new MBES (Kongsberg Maritime EM2040p and Norbit iWBMSH) drastically improves the data processing delays.

b) Areas of particular concern

The COVID-19 crisis has a severe impact on the global maritime and aerial freight in 2021. If the freight limitations are maintained, this will affect the availability of calibrated equipment used through Shom's activities (sound velocity probes, tide gauges...) and might compromise the operational schedule.

c) Any other matters of interest to the SWPHC

The airborne bathymetric lidar survey planned in 2021 in New-Caledonia was cancelled due to budget constraints. It is not planned to be carried out in the coming years.

Shom supports any initiative aimed at improving hydrographic knowledge and navigation safety, insofar as the data collected benefit the cartographic authorities and the updating of the nautical documentation of this region.

APPENDIX OF NATIONAL REPORT N°04/SHOM/DMI/REX/NP OF FEBRUARY 3RD, 2022

NATIONAL MSI SELF-ASSESSMENT

Country: FRANCE
Organization: Shom

1 MARITIME AREA

[Describe maritime area including details of the geographic boundaries]

The maritime area includes all maritime areas under French jurisdiction within the South West Pacific: it includes coastal waters (up to 250 NM) of French Polynesia, New Caledonia and Wallis and Futuna.

2 OPERATIONAL POINTS OF CONTACT FOR THE NATIONAL COORDINATOR

INSTITUTION	TELEPHONE	FACSIMILE	EMAIL
Shom, overseas office of the "Information and Nautical publication" department of the "Maritime Products and services" division	+33 2 56 312 303 +33 2 56 312 439 +33 2 56 312 273	/	na-om-all@shom.fr dops-psm-na-om@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 December 29th 2021).

[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 overseas territories within the MACHC region. Coastal warnings broadcasted through SAFETYNET	NTR	NTR
Terrestrial radiocommunications HF, MF and VHF means	NTR	NTR

[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
NTR	NTR	NTR	NTR	NTR	NTR

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?]

NTR.

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]

NTR.

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, Regional Hydrographic Commissions and the regional conferences related to MSI over past year (SMAN12, NCSR7, DRWG19).

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 X and XIV:

AREA	COUNTRY	NAME	TELEPHONE	FACSIMILE
X and XIV	France - New Caledonia	Maritime Rescue Coordination Centre Nouméa https://www.mrcc.nc/	+687 292 121	+687 292 303
		EMAIL	operations@mrcc.nc	
XIV	France French Polynesia	Joint Rescue Coordination Centre Tahiti http://www.jrcc.pf/	+689 40 541 615	+689 40 423 915
		EMAIL	contact@jrcc.pf	

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 SWPHC region.

Shom controls and coordinates the warnings issued by its national delegated coordinators.

LISTE DE DIFFUSION

DESTINATAIRES :

- SWPHC CHAIR (LINZ - NZ)
- IHO SECRETARIAT

COPIES INTÉRIEURES :

- DG
- DMI
- DMI/REX
- GOP
- ARCHIVES (DMIDSD/2.007)