

**19TH MEETING OF THE SOUTH WEST PACIFIC HYDROGRAPHIC
COMMISSION (SWPHC19)
VTC, 23-25 February 2022**

NATIONAL REPORT FROM NEW ZEALAND TO THE SWPHC19

References:

- A. IHO Resolution 2/1997 as amended (see doc. C3-04.2A, [Appendix to Annex A](#))
- B. IHO Circular Letter 20/2019, The IHO Online Form System for responses to Circular Letters and input to IHO Publications (P-5 and C-55): [link](#)
Online system for P-5 (Yearbook): [link](#)
Online system for C-55 (Status of Surveys and Charting Worldwide): [link](#)
- C. IHO Strategic Plan: [link](#)
- D. IHO IRCC CL 01/2021 IHO Strategic Plan for 2021-2026 – Procedure for measuring the Strategic Performance Indicator (SPI) allocated to IRCC: [link](#)

Executive summary

1. Hydrographic Office / Service:

- a) Name of the institution: Toitū Te Whenua Land Information New Zealand (LINZ).
- b) Description: The National Hydrographer (Adam Greenland) and Acting Group Manager Hydrography (Rachel Gabara) lead the New Zealand Hydrographic Authority (NZHA) in partnership. Both positions report to the Head of Location Information, Aaron Jordan. The Location Information group is part of the Customer Delivery group, lead by Jan Pierce, Kaihautū - Deputy Secretary, Customer Delivery.

The NZHA comprises 19 personnel, including three hydrographic surveyors, four nautical cartographers, three marine geospatial data specialists, two hydrographic systems analysts and a Technical Change Leader who leads a programme of work to implement the S-100 Universal Hydrographic Data Model and move the NZHA to a digital first, data centric environment.

- c) Submitted by: Stuart Caie, Manager Hydrographic Survey, scaie@linz.govt.nz

Detailed information to update IHO Publication P-5 (*Yearbook*) is submitted in Annex A (alternatively, use the online system, reference B). Please indicate "no change" in Annex A if this is the case.

2. Surveys:

[Describe any significant developments since the last RHC meeting in surveys related to the items below]

- a) Coverage of new surveys:

Surveys completed or in progress since SWPH18 are listed below:

Survey Number	Area	Completed
HYD-2122-HS69	Bluff and Stewart Island/Rakiura	In progress
HYD-2122-HS70	Banks Peninsula ¹	Jan 2022
HYD-2122-HS73	Nelson to Kahurangi Shoals	In progress
HYD-2122-HS74	Western Marlborough Sounds	In progress

¹ Partnership with Environment Canterbury Regional Council and the Department of Conservation to collect bathymetry and backscatter data for scientific purposes.



b) New technologies and /or equipment

The annual national civil hydrographic survey programme is delivered through a Supplier Panel established in 2017. The Panel utilise the latest technology for seabed mapping including bathymetry and seafloor / water column backscatter. Technologies include; vessel mounted laser scanner and Remotely Piloted Aircraft Systems (RPAS) to collect data in the intertidal zone (using autonomous systems to avoid hazardous areas); and Uncrewed Surface Vessel (USV) fitted with MBES.

c) New ships

LINZ does not own or operate survey vessels; these are operated by the Supplier Panel.

The Royal New Zealand Navy (RNZN) vessel HMNZS *Manawanui* was commissioned in June 2019. The vessel is expected to be available for deployment in Q3/Q4 2022 in NZ and the SWP region.

d) Crowdsourced and satellite-derived bathymetry - national policy

LINZ has approached suppliers and potential partners to trial CSB activities in NZ waters and beyond. Any trial will align with IHO CSB Guidelines B-12.

Working with New Zealand's Ministry of Foreign Affairs & Trade, LINZ has established a Marine Science Research (MSR) Coordinator role to liaise with

researchers to facilitate the timely receipt of all reports, data and samples. Copies of all data collected in areas under New Zealand's jurisdiction, or details of where such data can be obtained, are submitted to the Coordinator. All bathymetry data is held by LINZ. The data is being reviewed and assessed before making it discoverable on the LINZ Data Service. Further information is available from <https://www.linz.govt.nz/sea/marine-geospatial-information>.

In June 2021 LINZ collaborated with GNS Science on an innovative project to investigate the use of satellite derived bathymetry (SDB) in the near shore coastal environment. New satellite sensors (ICESat-2) using lasers can improve the accuracy of SDB in the absence of other baseline calibration data such as bathymetry from multi-beam echo sounders. LINZ's interest is in planning hydrographic surveys to delineate very shallow water areas where it is unsafe to place survey vessels. GNS's interest is the coastal zone where the geological formations, structures and faults extend from the onshore domain into the ocean. In addition to mapping geological features, tsunami modellers require good information on the depth and topography of the offshore coastal zone to accurately forecast wave runup and the impacts on coastal infrastructure and communities.

e) Challenges and achievements

The latest edition of the International Hydrographic Review contains an article written by Brad Cooper, Senior Hydrographic Surveyor at LINZ. Entitled *Effectively mapping and charting of remote locations with satellites, lasers and acoustics* the article outlines the approach taken by LINZ when conducting a multi-sensor survey (SDB, ALB, MBES) in the Kingdom of Tonga under the Pacific Regional Navigation Initiative. The article is available at <https://ihr.iho.int/articles/effectively-mapping-and-charting-of-remote-locations-with-satellites-lasers-and-acoustics/>.

Detailed information about surveys to update IHO Publications P-5 (*Yearbook*) and C-55 (*Status of Hydrographic Surveying and Charting Worldwide*) is submitted in Annexes A and B, respectively (alternatively, use the online system, reference B). Please indicate "no change" in Annexes A and B if this is the case.

3. New charts & updates:

[Describe any significant developments since the last RHC meeting in charting related to the items below]

New Zealand is the Primary Charting Authority (PCA) for five Pacific Island Countries (PIC)s, as below:

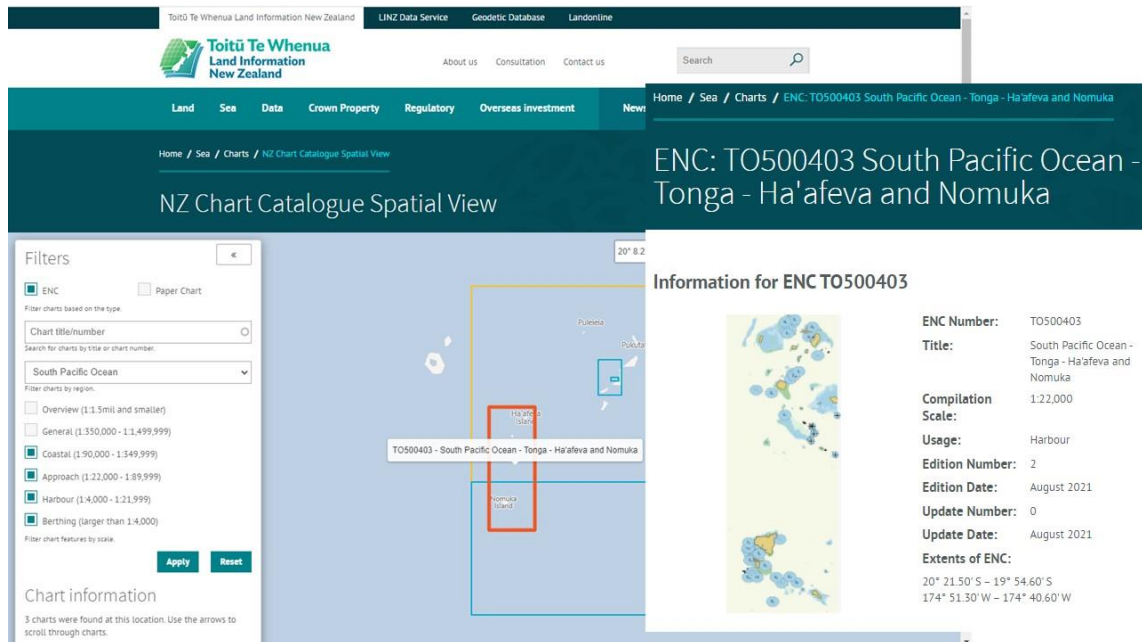
Nation	Paper Charts	ENCs	Fathoms/non-WGS84
Cook Islands	3	23	0
Niue	1	4	0
Samoa	7	7	2
Tokelau	1	4	0
Tonga	12	17	0*

* Four charts withdrawn and replaced with new charts

Through the NZ Aid programme, Pacific Regional Navigation Initiative (PRNI) LINZ established a chart improvement programme using new survey data. The table below shows the NC and NE charts and schedule for the remaining charts:

Nation	Paper Charts		ENCs	
	New Edition	New Chart	New Edition	New Chart
Cook Islands	1 (Jan 2019) 2 (Mar 2019)	3 (Feb 2022)	19 (Jun 2017) 3 (Nov 2018) 6 (Jan 2019)	22 (Jan 2022)
Niue	-	1 (Mar 2021)	2 (May 2018)	4 (Apr 2020)
Samoa	4 (Mar 2018) 1 (Jul 2019)	1 (Jan 2022) 2 (Feb 2023) 4 (Feb 2023)		1 (Jan 2022) 2 Jun (2022) 6 Jun (2022) 3 (Nov 2022)
Tokelau	1 (Mar 2019)	1 (Feb 2022)	4 (Mar 2019)	4 (Jan 2022)
Tonga	3 (Jan 2019) 2 (Apr 2019) 1 (Jun 2019)	3(Aug 2020) 1(Aug 2020) 2 (Aug 2021) 2 (Jan 2023)	1 (Nov 2018) 3 (Dec 2018) 2 (Feb 2019) 1 (Mar 2019) 1 (Jun 2019) 3 (Aug 2021)	3 (Mar 2020) 1 (May 2020) 2 (Mar 2021) 2 (Jun 2021) 8 (Dec 2021) 2 (Jun 2022)
INT Chart	-	1 (Aug 2019)	-	1 (Jun 2019)

LINZ has rebranded charts (ENC and paper) for the Cook Islands, Niue, Tokelau and Tonga with the two-digit country code. Samoa will be completed in 2023.



a) ENC coverage, gaps and overlaps

To date LINZ has published a total of 325 official New Zealand ENCs and has achieved full ENC coverage of New Zealand waters and area of responsibility.

An [on-line spatial viewer](#) provides detailed information of the full New Zealand ENC folio.

b) ENC distribution method

i. LINZ is a member of IC-ENC and distributes all New Zealand ENCs through the regional IC-ENC office.

ii. In July 2020 LINZ launched a local New Zealand ENC distribution service available at <https://www.linz.govt.nz/sea/charts/nz-enc-service>. The service is subscription based, providing mariners with access to free and regularly updated ENCs. ENC packages for Antarctica and the Pacific will be released Q1 2022.

New Zealand ENCs published since the SWPHC18 Meeting			
New Zealand Total: 26 New ENC: 1 NE ENC: 25	South West Pacific Total: 40 New ENC: 37 ¹ NE ENC: 3	Antarctica Total: 0 New ENC: 0 NE ENC: 0	INT Total: 0 New ENC: 0 NE ENC: 0

¹ Charts rebranded with country-code, six include new data.

New Zealand ENCs scheduled for publication in 21/22 FY			
New Zealand Total: 16 New ENC: 0 NE ENC: 16	South West Pacific Total: 46 New ENC: 46 ¹ NE ENC: 0	Antarctica Total: 0 New ENC: 0 NE ENC: 0	INT Total: 0 New ENC: 0 NE ENC: 0

¹ Charts rebranded with country-code.

c) RNCs

NZMariner is the product name of New Zealand's Official RNC folio, and is available for download in unencrypted BSB format, at no charge from the LINZ website at <https://www.linz.govt.nz/sea/charts/information-about-charts#nzmariner>.

d) INT charts

LINZ maintains 29 INT charts in Regions L and M.

e) National paper charts

New Zealand has a total of 165 paper charts (excl. INT Charts). Detailed information of the full New Zealand chart folio can be found on the [on-line spatial viewer](#).

New Zealand Paper Charts published since the SWPHC18 Meeting			
New Zealand Total: 7 NC: 0 NE: 7	South West Pacific Total: 12 NC: 12 ¹ NE: 0	Antarctica Total: 0 NC: 0 NE: 0	INT Total: 0 NC: 0 NE: 0

New Zealand Paper Charts scheduled for publication in 21/22 FY			
New Zealand Total: 15 NC: 0 NE: 15	South West Pacific Total: 10 NC: 10 ¹ NE: 0	Antarctica Total: 0 NC: 0 NE: 0	INT Total: 0 NC: 0 NE: 0

¹ Charts rebranded with country-code.

f) Other charts, e.g. for pleasure craft

Nothing to report (NTR)

g) Create S-10x products to meet future requirements

Work towards the IHO S-100 implementation decade, what have we done so far (achievements):

- Determined new scale ranges for source data
- Determined possible new scale less usages which will be maintained and processed product independent
- Test conversion from S-57 to S-101 (multiple data sets)
- Analysing the results in depth to determine the current ease and accuracy of conversion of LINZ specific data

In the next 12 months:

- Investigation of how best we can utilise SCAMIN attribute on scale less usages
- Investigation of possible encoding improvements to improve the transformation automation with a larger success rate.
- Developing customised S-101 mapping files for LINZ specific encoding and for custom source features and attributes.
- Review of dropped attributes and their impact on S-101 products.
- Investigation into other S-10X products

Detailed information about charting to update IHO Publications P-5 (*Yearbook*) and C-55 (*Status of Hydrographic Surveying and Charting Worldwide*) is submitted in Annexes A and B, respectively (alternatively, use the online system, reference B). Please indicate "no change" in Annexes A and B if this is the case.

h) Challenges and achievements

In February 2022 a total of 47 ENCs and 17 paper charts had been published for the Cook Islands, Niue, Samoa, Tokelau and Tonga with the country's two-letter country code i.e., Cook Islands CK.

S-100 challenges:

- Evolving S-101 encoding guidance,
- To meet the needs of mariners while transition the source data into the new scale structure
- Conversion of S-57 INFORM attributes into S-101. LINZ has previously encoded specific text information in the S-57 INFORM attributes, which can not be converted easily

4. New publications & updates:

[Describe any significant developments since the last SWPHC meeting in nautical publications related to the items below]

a) New Publications

NTR

b) Updated publications

The New Zealand Nautical Almanac is updated annually and released on 1 July.

c) Means of delivery, e.g. paper, digital

The New Zealand Nautical Almanac is delivered as a hard copy publication and as a PDF in it's entirety and separate sections, available [on-line](#).

d) Challenges and achievements

As LINZ continues to move to a digital first environment, managing customers expectations about publications is often a challenge, particularly any withdrawal of paper products.

In a move to reduce time and effort in the publication of the Nautical Almanac, LINZ has implemented an automation process to produce the List of Lights. Scripts harvest the database for information from AtoN objects.

Detailed information to update IHO Publication P-5 (*Yearbook*) is submitted in Annex A (alternatively, use the online system, reference B). Please indicate "no change" in Annex A if this is the case.

5. MSI

[Describe the status of Maritime Safety Information (MSI) related to the items below]

a) Existing infrastructure for MSI dissemination

LINZ publishes Annual Notices to Mariners (available in the Nautical Almanac and online) and fortnightly Notices to Mariners (NtM) distributed via an email subscription service (<http://www.linz.govt.nz/sea/maritime-safety/notices-mariners/subscribe-fortnightly-edition-notices-mariners>) and available online at <http://www.linz.govt.nz/sea/maritime-safety/notices-mariners>. The subscription service allows users to select which charts they receive notices for.

A dedicated email address has been established for receipt of information pertinent to NtMs, ntm@linz.govt.nz.

Maritime New Zealand (Maritime NZ) is the NAVAREA XIV Coordinator and the New Zealand National MSI Coordinator rccnz@maritimenz.govt.nz. Navigational warnings are available from the MNZ website <https://www.maritimenz.govt.nz/commercial/safety/maritime-radio/navigational-warnings.asp>

See the following NAVAREA XIV reports:

- The [MSI Self-Assessment report for NAVAREA XIV](#) for the period July 2020 to June 2021 was submitted to the IHO World-Wide Navigational Warning Service (WWNWS) Sub-Committee Meeting (WWNWS13) held online from 30 August to 3 September 2021.
- NAVAREA XIV Report to SWPHC19 and National MSI Coordinators self-assessments.

In an effort to improve communications and ensure contact details are correct, the NAVAREA XIV Coordinator conducts six monthly communications checks with nine National Coordinators. Since inception the response rate has been 100%. The last communications check identified changes in contact details for two National Coordinators.

b) Statistics on work of the National Coordinator

MSI received from Coastal States within NAVAREA XIV

Coastal State/Country	Number of MSI messages	Topics/Subjects of messages	IHO CB Funded MSI Courses Attended
Cook Islands	0		2010, 2014, 2016, 2018
Fiji	33	AtoNs, Cable laying ops, Pipeline installations, Wrecks, Tropical cyclone damage, Towing of large floating dock	2010, 2014, 2016, 2018
French Polynesia	90	Military exercises, Space debris, Drifting hazards, Towing operations and AtoNs	2010, 2014, 2016, 2018
Kiribati	0*		2016, 2018
New Caledonia	14	Military exercises, Drifting hazards and SAR operation	2010, 2014, 2016, 2018
Niue	1	AtoNs	2016, 2018
Samoa	1	Data collecting buoys	2016, 2018
Tonga	2	Military exercises	2010, 2014, 2016, 2018
Tuvalu	0		2016, 2018
Wallis & Futuna	0		Covered by New Caledonia

*Kiribati lies mostly within NAVAREA XI so MSI will likely be sent directly to the NAVAREA XI Coordinator

- c) New infrastructure in accordance with GMDSS Master Plan
Refer section 2 of [NAVAREA XIV report](#) to WNWNS13 and Operational Issues section of NAVAREA XIV Report to SWPHC19.
- d) Challenges and achievements
Refer section 8 of [NAVAREA XIV report](#) to WNWNS13 and Synopsis section of NAVAREA XIV Report to SWPHC19.

Detailed information about MSI to update IHO Publication C-55 (*Status of Hydrographic Surveying and Charting Worldwide*) is submitted in Annex B (alternatively, use the online system, reference B). The national self-assessment of MSI is submitted in Annex C. Please indicate "no change" in Annexes B and C if this is the case.

6. C-55

The table with the latest information to update IHO Publication C-55 (*Status of Hydrographic Surveying and Charting Worldwide*) is provided in Annex B (alternatively, use the online system, reference B). Please indicate "no change" in Annex B if this is the case.

Please provide a table of navigationally significant areas (e.g., Charted traffic separation schemes, anchorages and channels) within your area of jurisdiction. Please reference geographical locations as per largest scale chart. This information will be used to derive an estimate % figure for the Region. Examples are provided in the table below.

Ref. IHO Strategic Plan, Goal 1, Target 1.2, SPI 1.2.2.

Navigationally significant area	Location	Chart
Anchorage 1 to 3	Approaches to Opuia, Bay of Islands	NZ 5124
Anchorage A1 to A4	Approaches to Marsden Point, Whangarei	NZ 5214
Main channel	Approaches to Marsden Point, Whangarei	NZ 5214
Anchorage 1 to 11	Hauraki Gulf, Auckland	NZ 5321

Rangitoto Channel	Auckland Harbour	NZ 5322
Anchorage 1 to 8	Waitemata Harbour, Auckland	NZ 5322
Anchorage 1 to 10	Tauranga Harbour	NZ 5411 & 5413
Main channel	Tauranga Harbour	NZ 5411
Anchorage	Approaches to Gisborne, Poverty Bay	NZ 5571
Main channel, preferred route	Wellington Harbour	NZ 4634
Main channel	Tory Channel/Kura Te Au, Cook Strait	NZ 6154
Main channel	Queen Charlotte Sound/Tōtaranui, Marlborough	NZ 6153
Anchorage 1 & 2	Queen Charlotte Sound/Tōtaranui, Marlborough	NZ 6153
Anchorage	Picton Harbour	NZ 6154
Anchorage	Cloudy Bay, Cook Strait	NZ 463
Anchorage	Lyttelton Harbour/Whakaraupō	NZ 6321
Main channel	Lyttelton Harbour/Whakaraupō	NZ 6321
Anchorage 1 to 6	Akaroa Harbour, Banks Peninsula	NZ 6324
Main channel	Timaru Harbour	NZ 6422
Main channel	Otago Harbour	NZ 6612
Main channel	Bluff Harbour	NZ 6821
Anchorage	Stewart Island	NZ 681
Cruise shipping routes	Fiordland National Park, South Island	NZ 7621, 7624, 7625, 7653 & 7654
Anchorage	Approaches to Nelson, Tasman Bay/Te Tai-o-Aorere	NZ 6142
Main channel	Nelson, Tasman Bay/Te Tai-o-Aorere	NZ 6142

7. Capacity Building

[Describe the need for or ability to offer Capacity Building in relation to the items below]

a) Offer of and/or demand for Capacity Building

In line with Goal 1 of the IHO Strategic Plan 2021-2026, LINZ has initiated a programme of work (Project Janus) to implement and adopt S-100. As a small team, the NZHA will seek CB activities to enable LINZ to meet the Decade of Implementation.

b) Training received, needed, offered

LINZ has challenges in recruiting experienced staff. With few qualified and/or experienced candidates available and two IBSC S-5B (defence & civil) Hydrographic Surveying course in the region, it is generally necessary to recruit from further afield.

c) Status of national, bilateral, multilateral or regional development projects with a hydrographic component. (In progress, planned, under evaluation or study)

Since 2015, LINZ and the New Zealand Ministry of Foreign Affairs & Trade (MFAT) have worked on the Pacific Regional Navigation Initiative (PRNI) which focuses on navigation-related aspects of maritime safety. The primary focus for LINZ is on assisting those five Pacific Island Countries (PICs) where New Zealand is the Primary Charting Authority (PCA), namely Cook Islands, Niue, Samoa, Tonga and Tokelau.

To-date:

- Hydrography Risk Assessments for Cook Islands, Niue, Samoa and Tonga have been completed, presented to the respective governments and are available on the [LINZ website](#);
- an analysis of vessel traffic in and around Tokelau has been completed, used by SPC as the basis of their Safety-of-Navigation programme and is available on the [LINZ website](#);

- bilateral arrangements with the Cook Islands, Niue, Samoa and Tonga have been signed;
- hydrographic survey work in the Cook Islands, Niue, Samoa, Tokelau and Tonga has been completed including; Satellite Derived Bathymetry (SDB) over nine islands of the Cook Islands, throughout Tonga and Beveridge Reef in Niue; Airborne Laser Bathymetry (ALB) in Tonga and Niue; and Multibeam echo sounder (MBES) survey in Tonga and Samoa;
- survey data delivered to Tonga, Niue and Samoa;
- chart improvement programmes for the Cook Islands, Niue, Samoa, Tokelau and Tonga have been progressed. Updated ENC's and paper charts have been published incorporating new hydrographic survey data. All new charts have been re-branded with the country's two-letter code.

The focus for the past 12 months has been improving the charts for Tonga, in particular, withdrawing all charts on undetermined datums and in fathoms. The next 12 months will focus on completing chart improvements for Samoa, incorporating survey data, and rebranding the charts with the two-letter country code.

In 2019 MFAT commissioned an independent review of their funded maritime activities in the Pacific. The activity evaluation report and subsequent MFAT management response are available on the [MFAT website](#):

- Management Response – Review of Maritime Activities 2021
- Activity Evaluation – Review of Maritime Activities July 2021

The review recognised the importance of LINZ maintaining charts developed under PRNI, and the need to leverage ongoing hydrography capacity building for the nations, including through the SWPHC. The review also noted the work LINZ carried out on a standardised risk assessment model to identify the most crucial work and provide best return on investment.

d) Description of proposals and requests to the IHO CBSC

Actions required for NZ and other SWPHC members to achieve the Goals, Targets and Strategic Performance Indicators of the IHO Strategic Plan 2021-2026 will form future proposals and requests to the IHO CBSC.

8. Oceanographic activities

[Describe any significant developments in oceanographic activity since the last SWPHC meeting related to the items below]

a) General

Within New Zealand there are two Crown Research Institutes (CRI) involved in oceanographic studies: NIWA, the National Institute of Water and Atmospheric <http://www.niwa.co.nz/> and GNS Science <http://www.gns.cri.nz/>.

Both operate data portals allowing users to discover and access a wide range of New Zealand marine geospatial data.

- GNS: <https://data.gns.cri.nz/tez/>

- NIWA: <https://marinedata.niwa.co.nz/project-map-sam/>

New Zealand operates an Ocean Data Network data portal (<https://nzodn.nz/>), a node of the Australian Ocean Data Network (AODN <https://portal.aodn.org.au/>).

NIWA vessels (RV Tangaroa and RV Kaharoa) undertook a number of oceanographic

voyages over the last 12 months. These include: a 16-day deep-ARGO voyage; 15 days with deep-sea moorings off Kaikoura; deployments of CTD sensors off the Chatham Rise and the west coast of the South Island; and 130 days deploying ARGO floats in the Pacific Ocean and Tasman Sea.

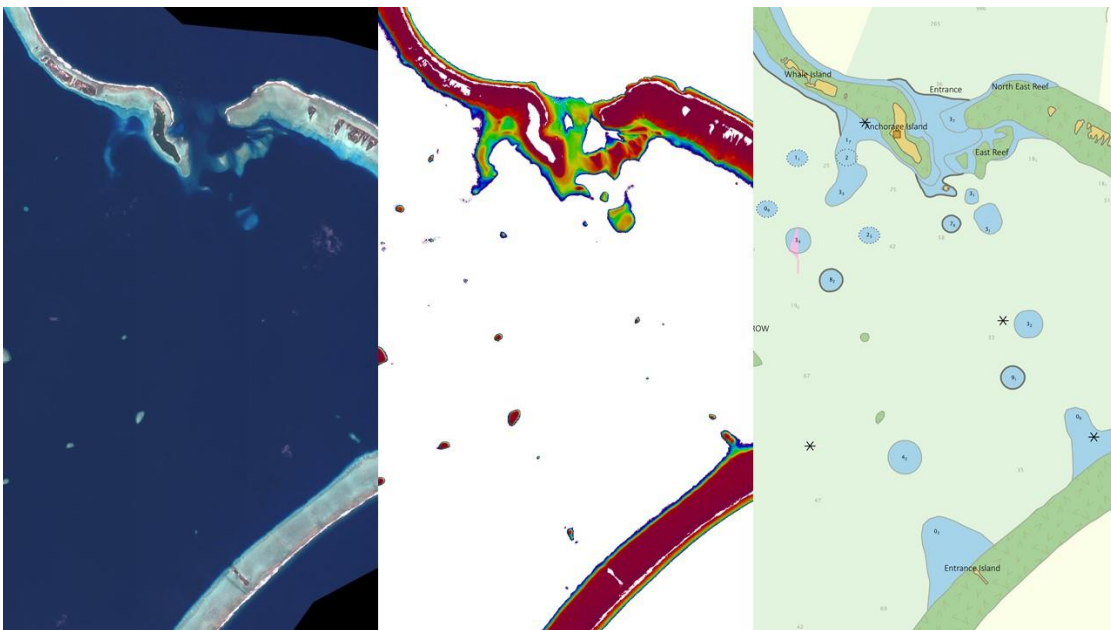
b) GEBCO & Seabed 2030

GEBCO's current gridded bathymetric data set, the GEBCO_2021 Grid, is a global terrain model for ocean and land, providing elevation data, in meters, on a 15 arc-second interval grid. It is accompanied by a Type Identifier (TID) Grid that gives information on the types of source data that the GEBCO_2021 Grid is based.

New Zealand is the Seabed 2030 Regional Data Assembly and Coordination Center (RDACC) for the South and West Pacific Ocean and operates the South and West Pacific Data Center (SaWPac). The SaWPac is run jointly by NIWA/GNS/LINZ and is hosted by NIWA. The next data delivery from the SaWPac is planned for late-February 2022. This will contribute to the Seabed 2030 project release of the GEBCO grid in 2022.

Due to COVID-related travel restrictions the Second SaWPac Regional Mapping Workshop was held again on-line 21-23 July 2021. Fifty-four participants from 18 countries and/or institutes attended the workshop. The next SaWPac Regional Mapping Workshop is planned as a hybrid in-person/virtual event for July 2022. Representatives from countries in the South and West Pacific are encouraged to contribute bathymetry data from their area to the Seabed 2030 project.

In May 2021 LINZ partnered with NIWA and Seabed 2030 to map three of the Cook Islands (Suvarrow, Pukapuka and Aitu) using Satellite Derived Bathymetry. Funding from LINZ and Seabed 2030 enabled a 2m resolution Digital Elevation Model to be created and used to update the nautical charts.



Suvarrow SDB: satellite image, bathymetry, ENC

c) Crowdsourced Bathymetry Activities

Data loggers were successfully installed and used on six vessels of varying size and deployed around offshore islands in New Zealand waters in late-2021. The data from

these loggers are now at SaWPac and currently in the process of being quality checked and then passed on to the IHO CSB Trusted Node at the Seabed 2030 Global Center. Data loggers are also currently installed on some of NIWA's small vessels and talks are underway to deploy data loggers on some of the New Zealand Coastguard fleet.

There is an active project to deploy 50 data loggers in Palau. NGA has offered to assist with the installation of the loggers onto vessels.

NZ is actively investigating other CSB opportunities and supporting regional projects through SaWPac and encourage any organisation or vessel wishing to participate to contact the [SWPHC CSB/Seabed 2030 Coordinator](#).

d) Sea level gauge network

LINZ publishes tide predictions for Standard and Secondary Ports on the web <http://www.linz.govt.nz/sea/tides>.

LINZ, in partnership with GNS Science, has established a network of 18 sea level gauges to improve New Zealand's response to tsunami hazards. Further information is available at <http://www.linz.govt.nz/sea/tides/sea-level-data>.

Through the Joining Land & Sea (JLAS) Project, LINZ is collecting sea level data and completing tide gauge calibrations at 89 'coastal link' sites around New Zealand. This data will be used, initially, to constrain and calibrate a new tide model being developed by NIWA for New Zealand's EEZ. This will provide the tidal surfaces for the JLAS prototype tool to seamlessly connect land and sea datasets. The data collection involves establishing tide stations for a minimum of 35 days (often at sites where sea level observations have never been made before), calibrating existing tide gauges and surveying ellipsoidal heights on benchmarks that are connected to the sea level data.

e) New equipment

NIWA continues to deploy an array of new DART buoys with two deployment voyages over the last year. The DART buoy network will provide tsunami monitoring and detection information for Pacific countries, including Tokelau, Niue, the Cook Islands, Samoa and Tonga as well as New Zealand (<https://www.beehive.govt.nz/speech/dart-buoys-announcement> and <https://www.beehive.govt.nz/release/new-zealand-tsunami-monitoring-and-detection-system-be-established>)

f) Challenges and achievements

JLAS Project. Since 2018, 58 coastal link sites have been installed and calibrated by two contractors, iXblue Pty Ltd and Southern Hydrographic Limited, with another 11 in progress.

9. Spatial data infrastructures

a) Status of MSDI

LINZ approach to SDI is in line with the UN-GGIM Integrated Geospatial Information Framework (IGIF). Rather than developing one single system, the NZ preference is to follow an integrated approach based on FAIR data principles (findable, accessible, interoperable and reusable), common standards and interoperability.

LINZ continues to lead the NZ Marine Geospatial Information Working Group (NZMGI-WG) and [national work programme](#) to encourage improved access and reuse of MGI. There are several data portals within NZ which host and serve MGI. The NZ MGI WG has published details of portals containing NZ MGI on the LINZ website.

b) Relationship with the NSDI

The [LINZ Data Service](#) provides free online access to LINZ's most up-to-date land and seabed data. Users are able to discover, view and access to hydrographic and topographic data.

c) Involvement in regional or global MSDI efforts

LINZ regional involvement through:

- i. SWPHC MSDI WG
- ii. AusSeabed
- iii. GEBCO Seabed 2030 South and West Pacific Ocean Regional Centre

LINZ global involvement through:

- i. IHO MSDI WG
- ii. OGC Marine Domain WG
- iii. UNGGIM Marine Geospatial WG

d) National implementation of the [UN Statement of Shared Guiding Principles for Geospatial Information Management](#) – including any national data policy and impact

on marine data. Ref: IHO Strategic Plan, Goal 2, Target 2.3, SPI 2.3.1 Number of HOs reporting success applying the principles in their national contexts.

NZ Government has published a refreshed Government Data Strategy and Roadmap <https://www.data.govt.nz/leadership/strategy-and-roadmap/>. Guidance and toolkits on data principles are published on data.govt.nz.

The NZ MGI WG has published guidance on NZ MGI metadata and data vocabularies.

e) MSDI national portal

New Zealand does not have a single MSDI portal. Several data portals that host NZ MGI were identified as part of the data portal study and their characteristics are described on the [MGI webpage](#).

f) Best practices and lessons learned

LINZ is improving its foundational capabilities in the management, storage, interoperability and sharing of geospatial data to better prepare for our digital future.

g) Challenges and achievements

Key achievements for the NZ MGI WG this year include:

- Developed guidance material for MGI metadata and data vocabularies to support interoperability of NZ's MGI,
- Published a list of data portals that host NZ MGI to help users find and access to MN MGI
- Developed guidance material to support organisations in undertaking MGI stocktakes, and contribute to a national NZ MGI inventory.

LINZ in Partnership with three other Government agencies (Department of Conservation, Ministry for Primary Industries, and Te Arawhiti / Crown Māori Relations) has secured

funding ([NZ Digital Government - Digital Government Partnership Innovation Fund](#)) to develop a Proof of Concept to improve MGI data access and integration. The Partner Agencies will test if a cloud-based datamesh technology can improve access and interoperability of MGI stored in different formats and locations, to support integrated marine management. The 6-month project (Q1&Q2 2022) will also seek to understanding the role of Māori and Iwi in marine data governance.

10. Innovation

a) Use of new technologies

The NZ long-term national civil hydrographic programme (HYPLAN), utilises new technologies, including vessel mounted mobile laser scanners to map the coastline; Unmanned Surface Vessels (USV); and Unmanned Aerial Vehicles (UAV) to identify hazards close inshore to mitigate health and safety risks.

The November 2021 edition of the International Hydrographic Review (IHR Volume 26) carries an article written by LINZ on the novel approach used to surveying remote regions. The approach was employed during the NZ Ministry of Foreign Affairs & Trade’s aid funded Pacific Regional Navigation Initiative (PRNI). The article can be found [here](#).

b) Risk assessment

All risk assessment reports completed by LINZ are available [here](#).

c) Policy matters

The New Zealand Hydrographic Authority (NZHA) is engaged with NZ Ministry of Foreign Affairs and Trade (MFAT) to review options for future work in the region in accordance with the [NZ Pacific Reset](#) and [NZ policy statement](#)

11. Other activities

[Describe any other significant developments of interest to the SWPHC since the last meeting related to the items below]

a) Participation in IHO meetings

IHO meetings since SHPHC18	Date
ENCWG	February 2021
S-101PT6	February 2021
SDBBPWG	March 2021
MSDIWG12	March 2021
CSBWG10	March/April 2021
IBSC44	April 2021
HSWG0	April 2021
S-101PT7	May 2021
ENCWG6	June 2021
HSWG1	June/July 2021
S-100WG	July 2021
CSBWG11	September 2021
IRCC Workshop Strategic Plan	October 2021
5 th Council Meeting (C5)	October 2021
S-101PT8	December 2021

HSWG2	February 2022
WENDWG12	February 2022

Future activities include:	
CSBWG12	March 2022
IBSC45	March/April 2022
ENCWG7	TBC
S-101WG6	TBC
MSDIWG13	May 2022
IBSC45	April 2022
IRCC14	TBC
6 th Council Meeting (C6)	October 2022

b) Meteorological data collection

New Zealand, through its National Meteorological Service, collects surface meteorological data as part of our international obligations to the Global Ocean Observing System operated by the Joint IOC/WMO Technical commission for Oceanography and Marine Meteorology.

A fleet of approximately 30 volunteer observer ships and 20 drifting meteorological buoys are utilised, and the data is disseminated through the WMO Global Telecommunications System for use in weather forecasting and climate studies.

c) Geospatial studies

Refer to section 9.

d) Preparation for responses to disasters

LINZ has an active role in co-ordinating and promoting the use of geographic data to support New Zealand to prepare for and respond to emergencies and climate change events. <https://www.linz.govt.nz/data/linz-data/resilience-and-climate-change>.

In January 2022, LINZ provided hydrographic datasets to NZ Defence Force and Australian Geospatial Organisation to support humanitarian & disaster relief response to Tonga following recent volcano and tsunami events. Data supplied included bathymetry surfaces and aerial imagery captured during the bathymetric LiDAR survey of 2019.

e) Environmental protection

NTR

f) Engagement with the Maritime Administration

LINZ and Maritime NZ signed an MOU in July 2017 (under review) to work together on matters of mutual interest. Strategic meetings are held every quarter.

g) Aids to Navigation matters

Maritime NZ are the authority responsible for [Aids to Navigation](#) in NZ.

h) Magnetic and gravity surveys

NTR

i) International engagements

Meetings & conferences since SWPHC18	
IC-ENC Technical Conference	May 2021
Seabed 2030 SaWPac Regional Mapping Community	July 2021
2nd SWPHC MSDIWG	August 2021
120th OGC Member Meeting	September 2021
NOAA Extratropical Surge and Tide Operational Forecast System (ESTOFS) SWPHC Online Workshop	September 2021
SWPHC S-100 Workshop	October 2021
3rd SWPHC MSDIWG	November 2021
SPC Regional Meeting for the Heads of Maritime Maritime	November 2021
GEBCO Map the Gapos Symposium	December 2021
SWPHC Hydrographic Leaders Programme Q&A webinar	December 2021
4th SWPHC MSDIWG	February 2022

Future activities include:	
SWPHC Hydrographic Leaders Programme	TBC
IC-ENC Technical Conference	March 2022

j) Others

Mapping NZ 2025 is LINZ's 10-year programme to deliver the mapping, data and expertise needed to address some of the most significant challenges facing NZ—such as climate change, urban growth and water. Our vision is seamless land and sea mapping, from Aoraki/Mount Cook to the edge of the continental shelf.

The programme includes initiatives, leadership and investment. It builds on core LINZ expertise in mapping and charting, and brings in new technologies and data partnerships with other organisations.

LINZ is improving its foundational capabilities in the management, storage, interoperability and sharing of geospatial data to better prepare for our digital future.

12. Conclusions

[Provide a short summary statement that highlights any of the following:]

a) *Areas of significant achievement***NZ MGI WG:**

- Developed guidance material for MGI metadata and data vocabularies to support interoperability of NZ's MGI,
- Published a list of data portals that host NZ MGI to help users find and access to MN MGI
- Developed guidance material to support organisations in undertaking MGI stocktakes and contribute to a national NZ MGI inventory.
- [NZ Digital Government - Digital Government Partnership Innovation Fund](#) approved 6-month proof of Concept to improve MGI data access and integration.

S-100:

- The NZHA has continued to make significant steps towards a digital first, data centric environment. In particular, there has been a focus on the implementation

of the new S-100 standard with an investigation into creating a S-100 database from the current S-57 objects.

Survey & Charting:

- 47 ENC's and 17 paper charts had been published for the Cook Islands, Niue, Samoa, Tokelau and Tonga rebranded with the country's two-letter country code i.e., Cook Islands CK.
- Additional funding approved by NZ MFAT to complete chart improvements for Samoa and Tonga under PRNI. This will enable the last of the Pacific charts to be rebranded with the two-letter country code, incorporate new survey data and allow the withdrawal of the last chart from the folio on an undetermined datum.
- Article '[Effectively mapping and charting of remote locations with satellites, lasers and acoustics](#)' published in the International Hydrographic Review (IHR Volume 26).

GEBCO Seabed 2030 & Crowd Sourced Bathymetry:

- [New Zealand Government signs agreement with Seabed 2030](#)
- CSB data loggers installed and used on six vessels. Data with SaWPac for quality control checks.
- Collaboration between Seabed 2030, NIWA and LINZ on high-resolution SDB for three of the Cook Islands.

Regional activities:

- SWPHC18, initial gap analysis for delivery of the IHO Strategic Plan
- NZ MFAT publish independent review and [MFAT response to review of funded maritime activities in the Pacific](#).

b) Areas of particular concern

- Recruitment and retention of staff
- Sustaining relationships with Pacific Island Countries and regional organisations due to COVID travel restrictions
- Capacity Building for S-100

c) Any other matters of interest to the SWPHC]

- ENC Service: Pacific and Antarctica packs to be launched Q1 2022
- Provision of hydrographic datasets to NZ Defence Force and Australian Geospatial Organisation to support humanitarian & disaster relief response to Tonga following recent volcano and tsunami events

Input to the IHO Publication P-5 (*Yearbook*)*Country: New Zealand**Organization: Toitū Te Whenua Land Information New Zealand*

(Please provide the information in English. Consider using the IHO Online Form System, see reference B)

Contact information/ Informations de contact / Información de contacto	
-National Hydrographer or equivalent -Directeur du service hydrographique ou équivalent -Director del Servicio Hidrográfico o equivalente	No change
-Head of the Hydrographic Office (if different from the person indicated above) -Directeur du Service Hydrographique (si différent de la personne indiquée ci-dessus) -Director del Servicio Hidrográfico (si diferente de la persona indicada anteriormente)	No change
-Other point(s) of contact -Autre(s) point(s) de contact -Otros punto(s) de contacto	
-Web site -site web -sitio web	No change
Country information / Informations sur le pays/ Información sobre el país	
-Declared National Tonnage -Tonnage national déclaré -Tonelaje Nacional Declarado	Tonnage: Date:
-National day -Fête nationale -Fiesta nacional	No change
-Date of establishment and Relevant National Legislation -Date de mise en place et législation nationale pertinente -Fecha de constitución y	No change

legislación nacional pertinente	
-Date first joined IHO -Date d'adhésion à l'OHI -Fecha de adhesión a la OHI	No change
-Date ratification Convention -Date de ratification de la Convention -Fecha de ratificación de la Convención	No change
-Remarks on membership -Remarques sur l'adhésion -Comentarios sobre la adhesión	No change
Agency information/ Information sur l'agence/ Información sobre la agencia	
-Top level parent organisation -Organisme mère -Organización asociada de nivel superior	No change
-Principal functions of the organisation or the department -Attribution principales de l'organisme ou du département -Principales funciones de la Organización o departamento	No change
-Annual operating budget -Budget annuel -presupuesto anual	
-Total number of staff employed -Effectifs totaux -Número total de personal empleado	
-Number of INT charts published -Nombres de cartes INT publiées -Número de cartas INT publicadas	29
-Total number of paper charts published-Nombre total de cartes papier	165

publiées-Número total de cartas de papel publicadas				
-Number of ENC cells published -Nombres de cellules ENC publiées -Número de células ENC publicadas	325			
-Number of Other charts -Nombre d'Autres cartes -Número de Otras cartas	NA			
-Type of publications produced -Type d'ouvrages produits -Tipo de publicaciones producidas	No change			
-Detail of surveying vessels/ aircraft -Détail des bâtiments hydrographiques / aéronefs -Detalle de los buques hidrográficos / aeronaves	-Name -Nom -Nombre	-Displacement -Déplacement -Desplazamiento	-Date Launched -Date de mise en service -Fecha de botado	-Number of crew -Nombre de l'équipage -Tripulación
-Other information of interest -Autres informations utiles -Otra información de interés				

Input to the IHO Publication C-55 (*Status of Hydrographic Surveying and Charting Worldwide*)

Country: New Zealand

(Please provide the information in English. Consider using the IHO Online Form System, see reference B)

C-55 Summary for:				Comments on Charts:
Country:	New Zealand			
Country Iso Code:	NZ			
Country SubCode:				
INT Region:	L			
Country/Depend:	C			
Last updated:	Feb 2019			
Provided by:	LINZ			
Chart coverage	Passage (%)	Coastal (%)	Port (%)	Comments on Surveys: Hydrographic surveys carried out in: Banks Peninsula and Bluff & Stewart Island.
INT	100	100	0	
RNC	100	100	100	
ENC	100	100	100	
Status of Paper Charts				
Paper charts with depths in meters (%)			100	
Paper charts referenced to a satellite datum (%)			100	
Status of surveys	Adequate (%)	Resurvey (%)	No survey (%)	
0-200m	79	21	0	
> 200m	3	9	87	

MSI	Y/N	Comments on MSI:
Local warning	Y	Promulgated by harbour masters
Coastal warning	Y	Promulgated by National Coordinator, NZ Rescue Coordination Center, Maritime NZ (MNZ)
Nav warning	Y	NAVAREA XIV Coordinator
Port warning	Y	
GMDSS	Y/N	Comments on GMDSS:
Master Plan	Y	Coordinated by Maritime NZ
Area A1	N	
Area A2	N	
Area A3	Y	
NAVTEX	N	

SafetyNet	Y	NAVAREA XIV messages broadcast via SafetyNET. Note MSI also promulgated via Iridium SafetyCast.
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National MSI Self-Assessment

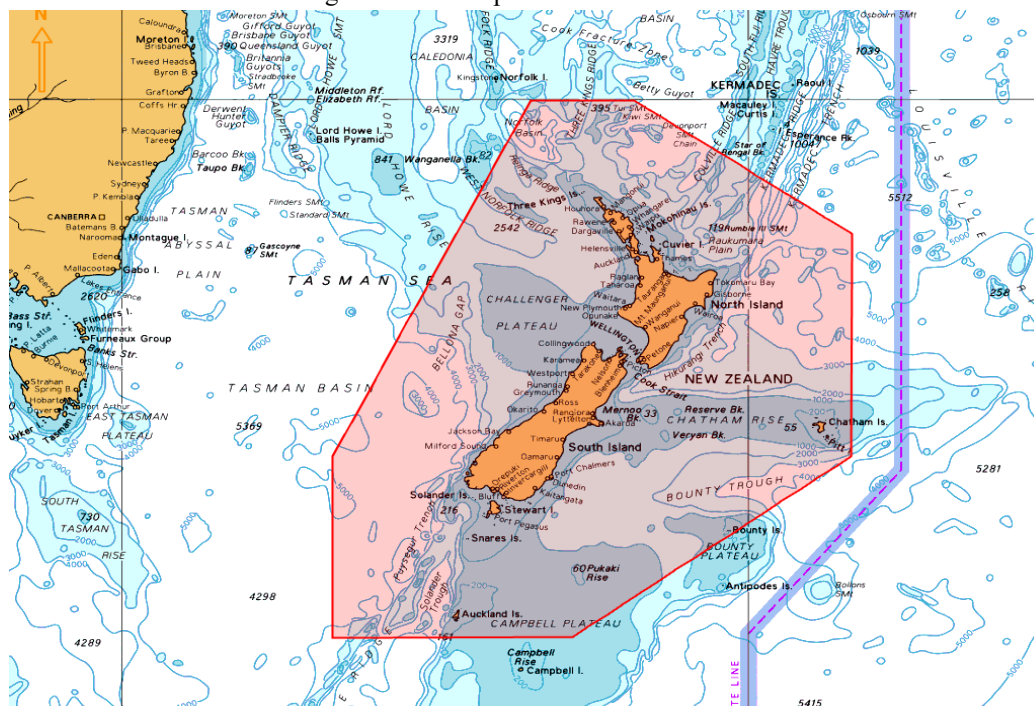
Country: New Zealand
 Organization: Maritime New Zealand

1. Maritime area

New Zealand Coastal Warning Area Z is a defined polygon for the purpose of broadcasting New Zealand Coastal Navigation Warnings via Inmarsat SafetyNET. The limits of the area are:

30-00S 169-30E to
 30-00S 174-30E to
 36-00S 175-00W to
 45-00S 175-00W to
 51-30S 171-30E to
 51-30S 160-00E to
 45-00S 160-00E

New Zealand Coastal Warning Area 'Z' is depicted below.



2. Operational Points of Contact for the National Coordinator

INSTITUTION	TELEPHONE	FACSIMILE	EMAIL
RCCNZ	+64 4 577830	+64 4 5778039	rccnz@maritimenz.govt.nz

3. GMDSS Master Plan

The GMDSS Master Plan updated via GISIS as at July 2021.

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

	Equipment Type	Software Version	Date of Update
Inmarsat	Sailor 6150 Mini-C	Firmware V1.07	
	Thrane & Thrane easyMail	V2.02 Build 006	28/2/2013
	SafetyNET II web interface	N/A	
Iridium	SafetyCast web interface	Version: 32.5.4-release.6 - API Version: 32.10.4-release.6	
	Email	N/A	

[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]:

2019		2020		2021	
Total	Average elapsed time	Total	Average elapsed time	Total	Average elapsed time
206	N/A	280	N/A	241	N/A

4. NAVTEX Coverage:

N/A

5. Operational Issues:

New Recognised GMDSS Mobile Satellite Service Providers

In February 2021 New Zealand declared to IMO all GMDSS services (MET, NAV and SAR) “Operational” via all recognized mobile satellite services.

6. Contingency Planning

- Technical - Maritime New Zealand (Kordia/Taupo Maritime Radio) uses the Inmarsat SafetyNET II and Iridium SafetyCast systems to broadcast Navigational Warnings. The versatility of using web portals, in addition to Kordia having back-up servers, reduces the risk of a New Zealand-based single point of failure. In the event of a total system failure at Kordia, web access is available via RCC New Zealand which also has back-up servers and multiple redundant systems in place.
- Physical – In the event of a building failure (fire, etc) RCC New Zealand has access to a Disaster Recovery site where the provision of WNWNS can continue.

7. Capacity Building

Capacity Building plans have been put on hold due to the COVID pandemic.

8. Other Activities

During 2021, the National Coordinator assisted the NAVAREA XIV Coordinator in attending meetings of the WWNWS SC, S-124 PT, IMO EGC Coordinating Panel, EGC API CG and MSI & SAR CG all via remote video conferencing.

9. National Maritime Website

Coastal Navigation warnings in force: www.maritimenz.govt.nz/navarea

During 2021 the NAVAREA XIV / Coastal Navigation warning web page received 26,414 page views.

The NAVAREA XIV / Coastal Navigation warning website is updated in near-real time. The date and time of the last update is displayed on the web page.

10. Recommendations

SWPHC to note the information provided

11. Summary

The New Zealand National MSI self-assessment highlights MSI activities for the period since SWPHC 18. The National Coordinator assists the NAVAREA XIV Coordinator in the day-to-day operational aspects of MSI, in addition to participating in relevant MSI-related meetings and correspondence groups. Of particular note since SWPHC 18, New Zealand has declared to IMO all GMDSS services (MET, NAV and SAR) “Operational” via all recognized mobile satellite services.