National Reports will be posted to the ICG/PTWS-XXXI website without TWFP contact details

NATIONAL REPORT

Submitted by Chile

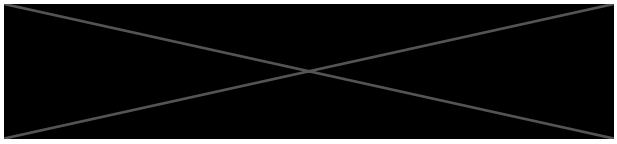
BASIC INFORMATION

(FILL IN SECTIONS 1-3 ONLY IF THERE IS A NEED TO COMMUNICATE OFFICIAL UPDATES.)

1. ICG/PTWS Tsunami National Contact (TNC)

The person designated by a Member State to an Intergovernmental Coordination Group (ICG) to represent his/her country in the coordination of international tsunami warning and mitigation activities. The person is part of the main stakeholders of the national tsunami warning and mitigation system. The person may be the Tsunami Warning Focal Point, from the national disaster management organization, from a technical or scientific institution, or from another agency with tsunami warning and mitigation responsibilities.

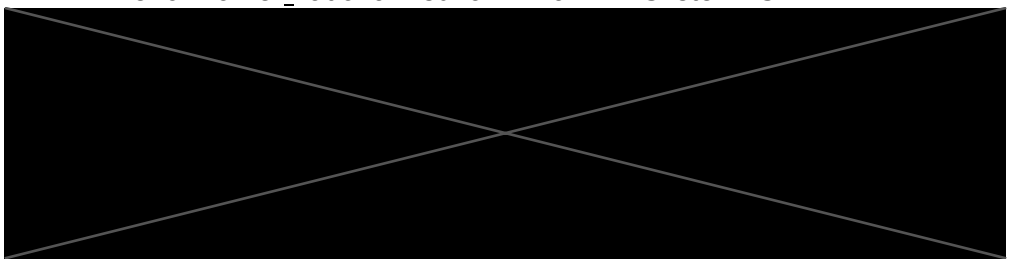
Name: Captain Carlos Zúñiga Araya
Title: Director
Organization: Chilean Navy Hydrographic and Oceanographic Service (SHOA)
Postal Address: Errazuriz #254, Pla a Ancha, Valparaíso, CHILE



2. ICG/PTWS Tsunami Warning Focal Point (TWFP)

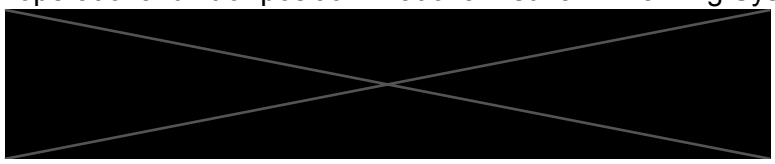
A 24 x 7 point of contact (office, operational unit or position, not a person) officially designated by the NTWC or the government to receive and disseminate tsunami information from an ICG Tsunami Service Provider according to established National Standard Operating Procedures. The TWFP may or not be the NTWC.

TWFP A enc name: National Tsunami Warnin S stem SNAM .



TWFP 24x7 point of contact (office, operational unit or position**, not a person**): Name of office,

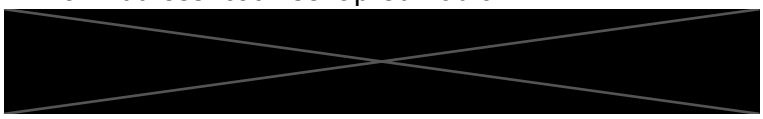
operational unit or position: National Tsunami Warning System (SNAM).



National Tsunami Warning Centre (if different from the above)
A centre officially designated by the government to monitor and issue tsunami warnings and other related statements within their country according to established National Standard Operating Procedures

NTWC Agency Name:
NTWC Agency Contact or Officer in Charge (person):
Name:
Position:
Telephone Number:
Email address:
Postal Address:

3. Tsunami Advisor(s), if applicable
(Person, Committee or Agency managing Tsunami Mitigation in country)
Name: National Disaster Prevention and Response Service (SENAPRED)
Title: National Disaster Management Office (NDMO).
Postal Address: Beaucheff #1671, Santiago, CHILE
E-mail Address: cat senapred. ob.cl



4. Tsunami Standard Operating Procedures for a Local Tsunami (when a local tsunami hazard exists)
For each situation, please provide the following:

- ***What organization identifies and characterizes tsunamigenic events?***

The Chilean Navy Hydrographic and Oceanographic Service (SHOA) identifies and characterizes tsunamigenic events depending on the earthquake source parameters, receiving information from the National Seismological Center (CSN) and other international agencies for seismic events; for other kinds of sources, it relies on real-time monitoring of the sea level network and field observations from the Maritime Authority

- ***What is the threshold or criteria for declaring a potential tsunami emergency?***

SHOA evaluates the potential tsunami emergency for seismic events with a magnitude above or equal to 7.0, using the Integrated Forecasting and Tsunami Warning System (SIPAT), to select pre-modeled scenarios worst results for expected Tsunami amplitudes and determine the Tsunami threat for the Chilean coast. These results for expected Tsunami amplitudes, real time measurements of tsunami amplitude by a sea-level station or field observation from a verified tsunami field observer of the Maritime Authority are used to determine the Tsunami Threat Level according to the following thresholds:

  - *Advisory: Between 0.3 and 0.9 meters.*
  - *Alert: Between 1.0 and 2.9 meters.*
  - *Alarm: Above 3.0 meters.*

- ***What organization acts on the information provided by the agency responsible for characterizing the potential tsunami threat?***

National Disaster Prevention and Response Service (SENAPRED)

- ***How is the tsunami information (warning, public safety action, etc) disseminated within country? Who is it disseminated to?***

Tsunami Warning bulletins are sent from SHOA to National Disaster Prevention and Response Service (SENAPRED), the National Maritime Authority (DIRECTEMAR), and the Chilean Navy

using e-mail, VHF and UHF communications, fax, a web page, an instant messaging application, Navy's internal messaging system and the Navy Emergency Communications Network (DATAMAR2). Alternative communications are available through fixed, mobile, satellite phones, and satellite internet.

SENAPRED acts on the information provided by SHOA and disseminates relevant information to government authorities and the community through direct communication, social networks and the SAE (Emergency Alert System) system, which consists of sending high-priority messages to mobile phones during disasters such as tsunamis using broadcast cell technology, without the need for applications or the Internet. The National Early Warning Unit (UAT-Nacional) of SENAPRED disseminates this information to regional and communal organizations (Municipality, Police, Firefighters and others).

- ***How is the emergency situation terminated?***

SHOA cancels the tsunami threat using information from sea level stations with criteria of at least three periods of tsunami waves with tsunami amplitudes less than 0.3 m and confirmation from the Maritime Authority's tsunami field observers. Once this information is received, SENAPRED, through its regional offices, will verify on the ground that the conditions for safe return exist for the population. Once this is verified, it disseminates the information to the population and executes a safe return protocol.

- ***For Distant Tsunami Procedures:***

What actions were taken in response to tsunami bulletins issued by PTWC, NWPTAC, and/or SCSTAC during the intersessional period?

  - *December 2nd 2023. Philippines. Magnitude 7.7 at 8.6 N°126.4 E*

SHOA received PTWC Tsunami threat Message 1 on Saturday December 2nd 2023 at 14:45 UTC, issuing a Preliminary Information Statement for local authorities at 14:48 UTC. PTWC Tsunami threat Message 2 and enhanced products were received at 1538 UTC. Based on this information, SHOA issued a Final Information Statement at 1544 UTC.

  - *January 1st 2024. Noto, Japan. Magnitude 7.3 at 37.28 N°137.27 E*

SHOA received PTWC Tsunami threat Message 1 on Monday January 1st 2024 at 07:22 UTC, issuing a Final Information Statement for local authorities at 07:22 UTC based on the reported Earthquake Magnitude and epicenter location.

  - *December 16th 2024. Vanuatu. Magnitude 7.4 at 17.7 S°167.8 E*

SHOA received PTWC Tsunami threat Message 1 on Tuesday December 17th 2024 at 01:54 UTC, issuing Final Information Statement for local authorities at 01:58 UTC, based on the reported Earthquake Magnitude and epicenter location.

For all the above cases, as for any other information received, regardless of whether final information is issued, SHOA also maintains constant monitoring of nearby sea level stations as well as DART buoys.

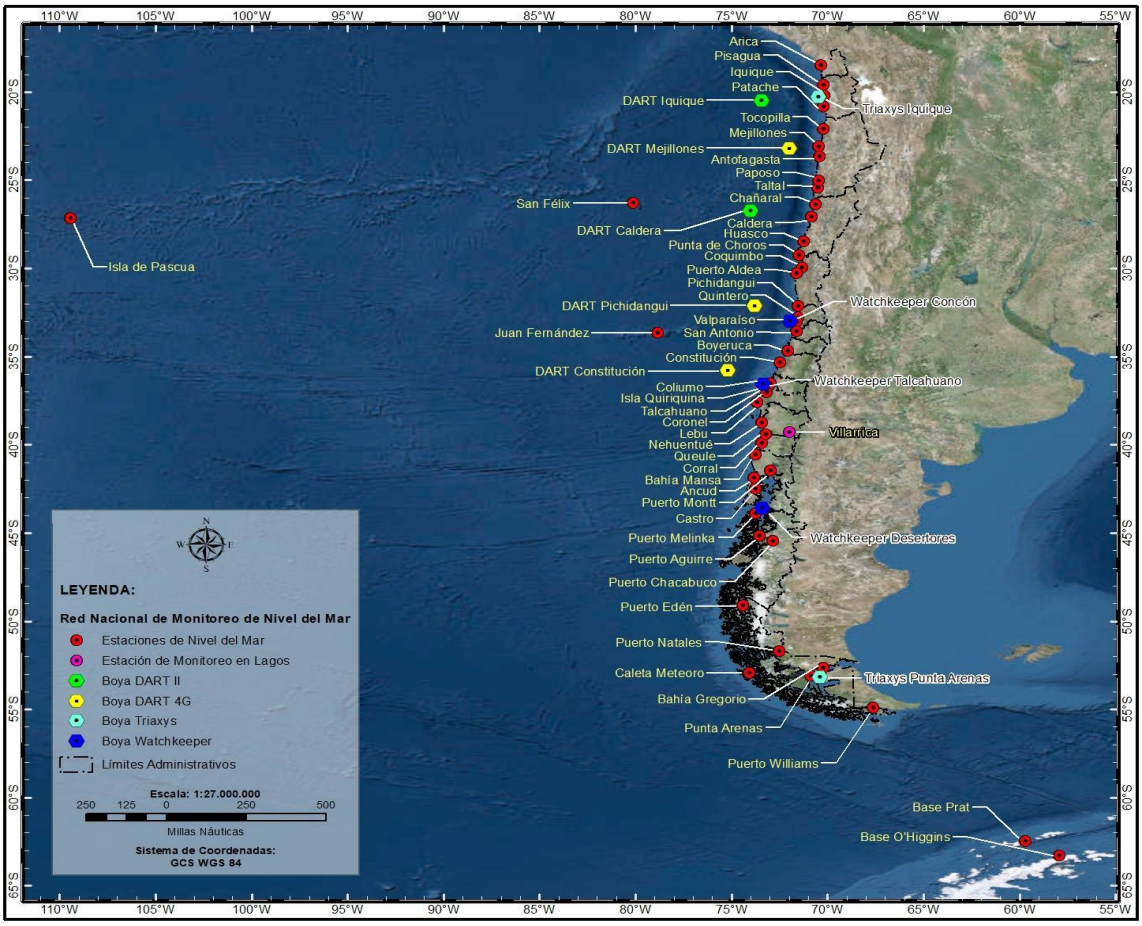
5. National Sea Level Network.

Please include a table with position and description of stations/sensors, and a map.

Site	LAT	LON	Sea Level Sensors	Sampling Rate	Telemetry	Transmission Interval
Arica	18° 28' 32.89" S	70° 19' 23.64" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Arica 2	18°28'9.53"S	70°19'24.85"W	Radar/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Pisagua	19° 35' 48.92" S	70° 12' 56.33" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Iquique	20° 12' 16.49" S	70° 8' 52.18" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Patache	20° 48' 11.57" S	70° 11' 52.89" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Tocopilla	22° 5' 37.51" S	70° 12' 41.55" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Mejillones	23° 5' 51.78" S	70° 27' 2.36" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Antofagasta	23° 39' 15.17" S	70° 24' 16.63" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Paposo	25° 0' 32.36" S	70° 28' 7.42" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Taltal	25° 24' 26.17" S	70° 29' 23.26" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Isla San Félix	26° 17' 32" S	80° 6' 31" W	Pressure/Radar	2 / 4 [Hz]	BGAN/GOES	1 / 5 [min]
Chañaral	26° 21' 6.34" S	70° 38' 1.53" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Caldera	27° 3' 52.63" S	70° 49' 29" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Huasco	28° 28' 7.69" S	71° 14' 59.09" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Isla de Pascua	27° 9' 17.42" S	109° 26' 21.93" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Punta de Choros	29° 14' 45.09" S	71° 28' 7.14" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Coquimbo	29° 56' 58.89" S	71° 20' 6.86" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Puerto Aldea	30° 17' 32.28" S	71° 36' 27.23" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Pichidangui	32° 8' 8.2" S	71° 31' 45.49" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Quintero	32° 46' 31.76" S	71° 31' 31.51" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Valparaíso	33° 1' 39.62" S	71° 37' 40.34" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
San Antonio	33° 34' 53.81" S	71° 37' 5.41" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Juan Fernández	33° 38' 9.74" S	78° 49' 47.54" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Boyeruca	34° 41' 14.30" S	72° 3' 28.30" W	Pressure/Pressure	2 / 2 [Hz]	GPRS/GOES	5 / 5 [min]
Constitución	35° 21' 20.61" S	72° 27' 25.31" W	Radar/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Coliumo	36° 32' 16.62" S	72° 57' 25.7" W	Pressure/Radar	4 [Hz]/ 4 [Hz]	GPRS/GOES	5 / 5 [min]
Isla Quiriquina	36° 38' 10.11" S	73° 3' 26.1" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Talcahuano	36° 42' 3.36" S	73° 6' 21.57" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Coronel	37° 1' 42.9" S	73° 9' 6.22" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Lebu	37° 35' 38.72" S	73° 39' 50.8" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Nehuentue	38° 44' 59.73" S	73° 24' 29.18" W	Pressure/Pressure	2 / 2 [Hz]	GPRS/GOES	5 / 5 [min]
Queule	39° 23' 51.42" S	73° 12' 54.19" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Corral	39° 53' 11.78" S	73° 25' 38.92" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Bahía Mansa	40° 34' 51.39" S	73° 44' 13.33" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Puerto Montt	41° 29' 5.75" S	72° 57' 39.09" W	Radar/Radar	4 [Hz]/ 4 [Hz]	GPRS/GOES	5 / 5 [min]
Ancud	41° 52' 2.55"S	73° 49' 58.37" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Castro	42° 28' 51.23" S	73° 45' 29.46" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Melinka	43° 53' 54.3" S	73° 44' 53.61" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Chacabuco	45° 28' 1.5" S	72° 49' 12.15" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Puerto Aguirre	45° 9' 52.42" S	73° 31' 15.92" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Puerto Edén	49° 7' 47.23" S	74° 24' 31.1" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Puerto Natales	51°43'44.90"S	72°30'56.46"W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Bahía Gregorio	52° 38' 53" S	70° 12' 33" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Caleta Meteoro	52° 57' 39.67" S	74° 4' 19.76" W	Pressure/Pressure	2 / 2 [Hz]	BGAN/GOES	1 / 15 [min]
Punta Arenas	53° 7' 25.39" S	70° 51' 43.18" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Puerto Williams	54° 55' 58.35" S	67° 36' 29.58" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]
Base Prat	62° 28' 45.65" S	59° 39' 43.29" W	Pressure/Pressure	2 / 2 [Hz]	BGAN/GOES	1 / 5 [min]
O'Higgins	63° 19' 13.13" S	57° 53' 55.43" W	Pressure/Pressure	2 / 2 [Hz]	BGAN/GOES	1 / 5 [min]
Villarrica	39° 16' 34.66" S	71° 58' 52.76" W	Pressure/Radar	2 / 4 [Hz]	GPRS/GOES	5 / 5 [min]

Tsunameters Deployed Systems

Location	Latitude	Longitude	Sensor Type	Sampling Interval	Transmission Interval
Iquique	20°28'26" S	073°25'17" W	DART II	15 [min]	06 [hr]
Mejillones	23°09'47" S	072°02'13" W	DART 4G	15 [min]	06 [hr]
Caldera	26°44'36" S	073°58'59" W	DART II	15 [min]	06 [hr]
Pichidangui	32°07'21" S	073°47'56" W	DART 4G	15 [min]	06 [hr]
Constitución	35°45'29" S	075°14'35" W	DART 4G	15 [min]	06 [hr]



6. Information on Tsunami occurrences

Please include sea level observations, pictures, wave arrival descriptions, public, media, or other responses to warnings, lessons learned, etc.

During the inter-sessional period, no emergency messages were sent.

7. Web sites (URLs) of national tsunami-related web sites

www.shoa.cl
www.snamchile.cl

8. Summary plans of future tsunami warning and mitigation system improvements.

Chile has an integrated Tsunami Warning and Prediction System (SIPAT) that connects various modules for detecting, assessing, disseminating, and monitoring tsunami threats. The system uses a database with pre-modeled scenarios for near-field events and is being developed to extend to regional events. Chile also developed a national project for Near Real-Time modeling using finite fault and inversion of sea level data, incorporating uncertainty in calculations, improving accuracy and continuous monitoring of tsunami events. The project is in the validation stage and awaiting actual operational test events. Additionally, Stand-Alone software has been developed to create provisional operation rooms with Tsunami Threat

Assessment capabilities.

NATIONAL PROGRAMMES AND ACTIVITIES INFORMATION

9. EXECUTIVE SUMMARY

Please provide a brief statement of no more than one page addressing all items discussed in the Narrative section of the National Report (below)

The focus of the Chilean NTWC in the last few years has been on improving the training programme, expanding the country's sea level monitoring network, improving data sharing at the regional level, strengthening tsunami warning and mitigation capabilities, and developing tsunami awareness activities with communities and government authorities.

The NTWC has implemented operational training drills at different levels, including on-duty, institutional, inter-institutional, and regional. These training exercises cover various scenarios and focus on internal procedures, coordination, communication, and response actions at different levels of impact, looking for opportunities for improvement and good practices.

The National Sea Level Network has been expanded by adding three new stations, increasing the total number of permanent stations to 49. Technological advancements have enabled improved data transmission through GPRS and satellite systems, especially in remote areas, enhancing the redundancy and robustness of the network.

A workshop titled "Shared Access to Sea Level Data: A Tool for Effective Regional Tsunami Emergency Response" was organized by Chile, bringing together representatives from the NTWC of Chile, Colombia, Ecuador, and Peru and experts from VLIZ, PTWC, and UNESCO/IOC. The workshop aimed to enhance regional tsunami warning and mitigation capabilities by building capacities for real-time data sharing from existing sea level stations through a public platform hosted by VLIZ. As a result, 26 additional sea level stations across the region agreed to share their data, fostering international cooperation in tsunami response.

Chile is strengthening its Tsunami Threat Assessment System called SIPAT, which operates as part of a more complex Decision Support System at the NTWC's Operation Rooms, to include far-field scenarios at a Regional level. Also, there are scientific projects to incorporate near real-time modeling based on finite faults and inversion of sea level data to assess tsunami threats at a later phase of the emergency, including uncertainty measures. The system is currently in the validation stage and awaiting an actual event for operational testing.

Tsunami awareness activities have been carried out in collaboration with universities, international organizations, and research centers. These activities aim to raise awareness about seismic and tsunami threats, including the seismic gap in the central zone of Chile. Additionally, Chile has hosted regional meetings and participated in seminars to promote collaboration and reduce risks associated with tsunamis.

Chile continuously produces Tsunami Inundation Maps (CITSU) based on modeling for extreme possible events. NTWC has made progress in updating and expanding the coverage of CITSU, including non-seismic sources such as landslides in fjords. The maps are publicly accessible through the SHOA website and the digital viewer maintained by SENAPRED.

These initiatives demonstrate Chile's commitment to conducting comprehensive training, enhancing its sea level monitoring network, strengthening regional cooperation in tsunami response, improving warning and assessment systems, raising awareness, and providing accessible information to protect populations from tsunami hazards.

10. NARRATIVE

Detailed description of innovations or modifications to National tsunami warnings procedures or operations since last National Report, tsunami research projects, tsunami mitigation activities and best practices (especially in preparedness and emergency management), tsunami exercises, as well as public education programmes or other measures taken to heighten awareness of the tsunami hazard and risk.

Operational Training Programme

Since 2021, Chile's NTWC has developed a training scheme based on four levels associated with the degree of involvement: on-duty personnel, institutional, inter-institutional (national level), and regional (international). Each of these levels has a different focus and specific objectives:

At the most basic level, there are daily exercises oriented to practicing internal procedures, the use of technical information, and the development of the first actions taken by the on-duty personnel in the face of far and near field events, with situations such as equipment failures, use of alternative systems, and operation flows.

The second level contemplates the whole SHOA organization, forming the different teams of decision makers, technical advisors, maintainers, and logistic support, facing scenarios with local affectation to the systems, injured personnel, damages to the infrastructure (collapse of buildings, fires, or flooding) and use of alternative operation rooms. These have a monthly frequency.

The third level involves the National Disaster Prevention and Response System (SINAPRED), including the NDMO and the National Seismological Center (CSN), generating actions from the national system to the local emergency units in the communities, focusing on coordination, primary and alternative communications links, unavailability of services due to local impact and communication of the threat and risk to the community. SINAPRED carries out these exercises quarterly.

The last one is the regional level, as part of the Regional Working Group of the Southeast Pacific Tsunami Warning and Mitigation System (SEP-WG), with the execution of coordination exercises between Chile, Colombia, Ecuador, and Peru, with scenarios of affectation to the regional block, with a focus on the improvement of the information shared among the NTWC. Given the level of coordination, these are carried out every six months, matching in 2024 with PACWAVE24.

On the other hand, SENAPRED works directly with the local disaster risk management units, generating evacuation drills for the coastline and educational institutions. These simulations are done at the community level, using scenarios prepared by the NTWC and involving local authorities.

Tsunami Mitigation Activities

Between August 19th and 30th, the Chilean Navy Hydrographic and Oceanographic Service (SHOA) and the International Tsunami Information Centre (ITIC), hosted in Valparaíso Chile, a new version of the TIC Training Programme on Tsunami Early Warning Systems and the PTWC Enhanced Products, Tsunami Evacuation Planning and Tsunami Ready Programme (ITP-TEWS 2024). This event gathered 31 participants from 19 different countries, including island countries from the Pacific and the Caribbean, to learn about the latest developments on Earthquake detection and evaluation, Tsunami Threat Assessment and monitoring as well as Emergency Preparedness and Mitigation. Since 2010, Chile has been affected by at least 5 destructive Tsunamis and this vast experience, placed our Country as a working example of an end-to-end tsunami warning and mitigation system.

Another tsunami mitigation activity is the preparation of Tsunami Inundation Charts (CITSU), which identify different levels of inundation in coastal areas after a tsunami event by numerical

modeling of the maximum probable levels. These serve as a tool to be used later in risk management by the competent authorities, identifying safe areas and evacuation routes. To date, Chile has 75 CITSU for the national territory.

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Date: 06/03/2025 Name: Lt Alejandro Maraboli-Quezada.