National Report to the Eighteenth Session of the Group of Experts for the the Global Sea Level Observing System (GLOSS)

Chilean Sea Level Network: Current State

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Introduction

The network of sea level stations has been operated by the Hydrographic and Oceanographic Service of the Navy since the installation of the first tide gauge in Valparaiso in 1941. Currently, the network consist of 49 stations which, in addition to measuring sea level, record environmental parameters such as water temperature, air temperature, atmospheric pressure and relative humidity over more than 4000 km of continental coastline, oceanic islands and Antarctica. 7 of these gauges contribute to the GLOSS Core Network (Figure 1).

Figure 1 : Chilean Sea Level Network

Since the network constitutes a fundamental support of the National Tsunami Warning System, all the sea level stations operate with a primary and a secondary sea level sensor (mainly a hydrostatic pressure sensor and a radar sensor), as well as redundant transmission system for the collected data.

Figure 2: Puerto Natales Sea level station (Inst. Sep. 2023).

Regarding telemetry systems, text messages through cell phone GPRS network remains the main data transmission system and GOES, is used as a secondary telemetry system. It should be noted that sea level stations of San Felix island (Lat: 26º 17' 32"S ; Long: 80º 06' 31"W), Caleta Meteoro (Lat: 52º 58' 00"S ; Long: 74º 03' 58"W), Puerto Soberania (Lat: 62º 28' 00"S ; Long: 59º 39' 00"'W) and Base O'Higgins (Lat: 62º 28' 00"S ; Long: 59º 39' 00"'W, are the only stations that have just satellite telemetry systems, GOES and INMARSAT-BGAN, due to the absence in these sectors of GPRS network (Table 1).

The sampling interval of sea level data is set to 1 minute. The data transmission frequency mostly ranges from 1 to 5 minutes. Usually data is transmitted every 5 minutes via the GOES satellite system and GPRS, while transmission is every 1 minute in those stations that have Inmarsat BGAN antennas.

Additionally, at SHOA headquarters more powerful servers to implement a new data management and visualization system were installed. The use of the Amazon web service has strengthened the capabilities in data availability and response within the framework of the National Tsunami Warning System.

The National Tsunami Warning System watch team, as well as a division dedicated to the control and operation of SHOA's network of sea level, DART buoys and wave stations, monitors sea level information on a daily basis. This is done by means of a daily operational report (Table 1), where transmissions and data quality

are monitored, in order to ensure the operability of at least one transmission channel/tidal sensor.

REPORTE DE OPERATIVIDAD ENM Y BOYAS OCEANOGRAFICAS

06-mar-2025 19:02

RED	ESTADO
ENM	93%
BOYAS DART	90%
BOYAS OCEANOGRAFICAS	100%

BLOQUE SIPAT	ESTACIÓN DE NIVEL DEL MAR	TRANSMISIÓN			SENSOR NIVEL DEL MAR		ESTADO
		GPRS	BGAN	GOES	PRS	RADAR	
B1	ARICA 2 (ENAPU)	OPE	N/A	OPE	OPE	OPE	OPE
B1	ARICA	OPE	N/A	OPE	OPE	OPE	OPE
B2	PISAGUA	OPE	N/A	OPE	OPE	OPE	OPE
B2	IQUIQUE	OPE	N/A	OPE	OPE	OPE	OPE
B2	PATACHE	OPE	N/A	OPE	OPE	OPE	OPE
B3	TOCOPILLA	OPE	N/A	OPE	OPE	OPE	OPE
B3	MEJILLONES	OPE	N/A	OPE	OPE	OPE	OPE
B4	ANTOFAGASTA	OPE	N/A	OPE	OPE	OPE	OPE
B4	PAPOSO	OPE	N/A	OPE	OPE	OPE	OPE
B4	TALTAL	OPE	N/A	OPE	OPE	OPE	OPE
B5	CHANARAL	OPE	N/A	OPE	OPE	OPE	OPE
B5	CALDERA	OPE	N/A	OPE	OPE	OPE	OPE
B6	HUASCO	OPE	N/A	OPE	OPE	OPE	OPE
B7	PUNTA DE CHOROS	OPE	N/A	OPE	OPE	OPE	OPE
B7	COQUIMBO	OPE	N/A	OPE	OPE	OPE	OPE
B7	PUERTO ALDEA	OPE	N/A	OPE	OPE	OPE	OPE
B7	PICHIDANGUI	OPE	N/A	OPE	OPE	OPE	OPE
B8	QUINTERO	OPE	N/A	OPE	OPE	OPE	OPE
B8	VALPARAÍSO	OPE	N/A	OPE	OPE	OPE	OPE
B8	SAN ANTONIO	OPE	N/A	OPE	OPE	OPE	OPE
B9	BOYERUCA[1]	OPE	N/A	NO OPE	NO OPE	OPE	OPE C/OBS
B10	CONSTITUCIÓN[1]	OPE	N/A	OPE	OPE	OPE	OPE
B11	COLIUMO	OPE	N/A	OPE	OPE	OPE	OPE
B11	ISLA QUIRIQUINA	OPE	N/A	OPE	OPE	OPE	OPE
B11	TALCAHUANO	OPE	N/A	OPE	OPE	OPE	OPE
B11	CORONEL	OPE	N/A	OPE	OPE	OPE	OPE
B11	LEBU	OPE	N/A	OPE	OPE	OPE	OPE
B12	NEHUENTÚE[1]	OPE	N/A	OPE	OPE	OPE	OPE
B12	QUEULE	OPE	N/A	NO OPE	OPE	OPE	OPE C/OBS
B13	VILLARRICA	OPE	N/A	OPE	OPE	OPE	OPE
B13	CORRAL	OPE	N/A	OPE	OPE	OPE	OPE
B14	BAHÍA MANSA	OPE	N/A	OPE	OPE	OPE	OPE
B14	PUERTO MONTT[2]	OPE	N/A	OPE	OPE	OPE	OPE
B15	ANCUD	OPE	N/A	NO OPE	OPE	OPE	OPE C/OBS
B15	CASTRO	OPE	N/A	OPE	OPE	OPE	OPE
B16	MELINKA	OPE	N/A	OPE	OPE	OPE	OPE
B16	PUERTO AGUIRRE	OPE	N/A	OPE	OPE	OPE	OPE
B16	PUERTO CHACABUCO	OPE	N/A	OPE	OPE	OPE	OPE
B17	PUERTO EDÉN	OPE	N/A	OPE	OPE	OPE	OPE
B17	PUERTO NATALES	OPE	N/A	NO OPE	OPE	OPE	OPE C/OBS
B17	CALETA METEORO[1]	N/A	OPE	OPE	OPE	OPE	OPE
B17	PUNTA ARENAS	OPE	N/A	OPE	OPE	OPE	OPE
B17	BAHÍA GREGORIO	OPE	N/A	OPE	OPE	OPE	OPE
B17	PUERTO WILLIAMS	OPE	N/A	OPE	OPE	OPE	OPE
B18	BASE PRAT[1]	N/A	OPE C/OBS	OPE C/OBS	OPE	OPE	OPE C/OBS
B18	BASE O'HIGGINS[1]	N/A	OPE	OPE	OPE	OPE	OPE
B19	JUAN FERNANDEZ	OPE	N/A	OPE	OPE	OPE	OPE
B20	SAN FÉLIX	N/A	OPE	OPE	OPE	OPE	OPE
B21	ISLA DE PASCUA	OPE	N/A	OPE	OPE	OPE	OPE

Table 1. Daily control.

OPE: Fully operational; **OPE c/OBS**: Partially operational (at least one Tx/sensor are F/operational); **NO OPE**: Tx/sensor down.

The stations capabilities have allowed SHOA to achieve a reliable network supplying data for operational and scientific purposes, which is verified by a large number of requests for information to our NODC and reports produced by international entities (Figs. 3).

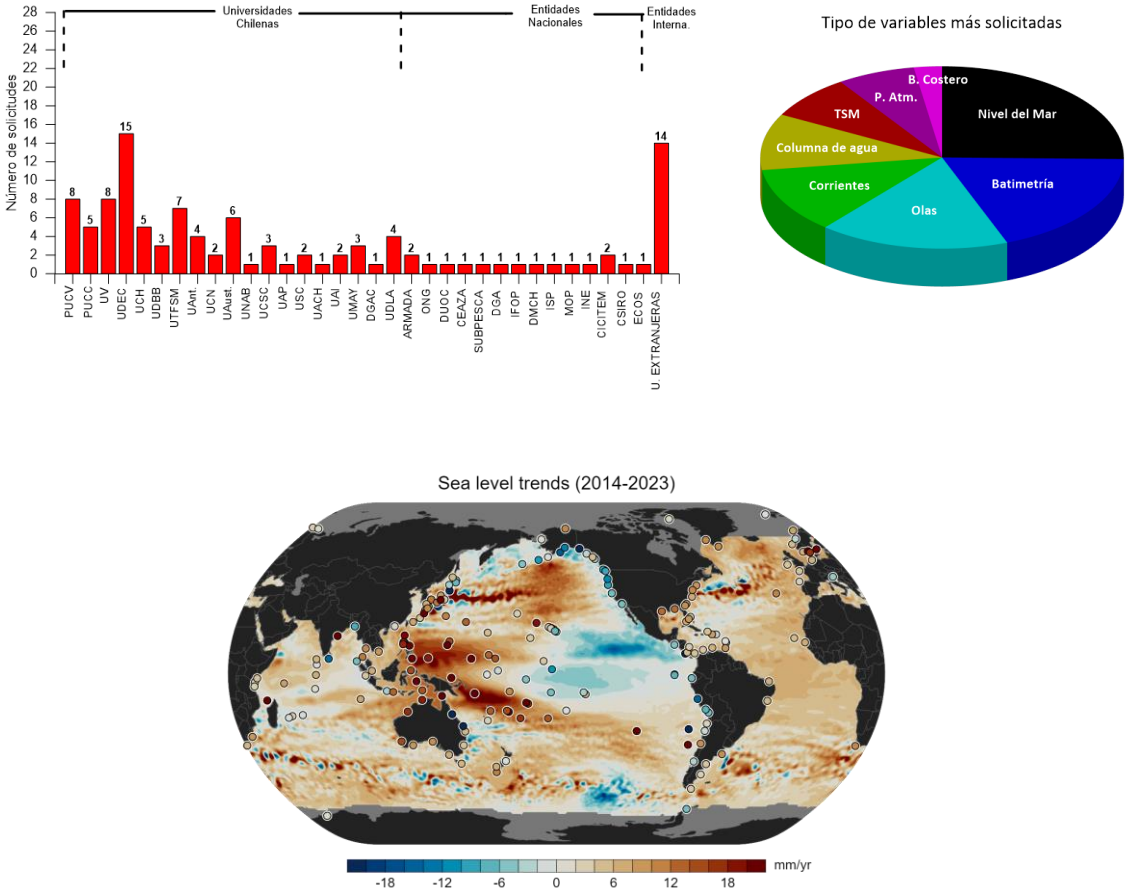

Figure 3. Top: number and percentage of annual data requests to the NODC; Lower: UHSLC Sea level trends (https://uhslc.soest.hawaii.edu/).

The data collected by the Chilean Sea Level Network are available through the website developed and maintained by VLIZ for UNESCO/IOC. In addition, the data can be accessed in real time through the SHOA website using the following link: http://www.shoa.cl/ and through the GOOS Regional Alliance for the South Pacific (GRASP) portal website "Regional Network Sea Level Stations" using the website developed and maintained by the Oceanographic and Antarctic Institute of the Ecuadorian Navy (INOCAR) https://coos.inocar.mil.ec/visores/red_mareografica/.

Chilean Sea Level Stations with real time telemetry

The next table summarizes the principal information of data collection platforms with real time sea level data transmissions.

STATION	LATITUDE °S	LONGITUDE °W	REAL TIME	SENSOR TYPE	REGISTER INTERVAL	SAMPLING INTERVAL	TRANSMIT INTERVAL	DATE INSTALL. SAT. PLATFORM	LAST LEVELLING	VLIZ/ IOC CODE	GLOSS ID
Arica Sitio 7	18° 28' 9.53"	70° 19' 24.85"	GPRS/ GOES	Radar / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2025	2025	enap	---
Arica	18° 28' 32.89"	70° 19' 23.64"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	1999	2025	aric	---
Pisagua	19° 35' 48.92"	70° 12' 56.33"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2010	2024	pisa	---
Iquique	20° 12' 16.49"	70° 8' 52.18"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	1999	2024	iqui	---
Patache	20° 48' 11.57"	70° 11' 52.89"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2011	2024	pata	---
Tocopilla	22° 5' 37.51"	70° 12' 41.55"	GPRS/ BGAN	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2010	2024	toco3	---
Mejillones	23° 5' 51.78"	70° 27' 2.36"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2011	2025	meji	---
Antofagasta	23° 39' 15.17"	70° 24' 16.63"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	1999	2024	anto	**174**
Paposo	25° 0' 32.36"	70° 28' 7.42"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2013	2024	papo	---
Taltal	25° 24' 26.17"	70° 29' 23.26"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2010	2025	talt	---
Isla San Félix	26° 17' 32"	80° 6' 31"	GOES/ BGAN	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 1 [min]	1999	2024	sanf	**177**
Chañaral	26° 21' 6.34"	70° 38' 1.53"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2012	2024	chnr	---
Caldera	27° 3' 52.63"	70° 49' 29"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	1999	2024	cald	---
Huasco	28° 28' 7.69"	71° 14' 59.09"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2010	2024	huas2	---
Isla de Pascua	27° 9' 17.42"	109° 26' 21.93"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	1999	2024	east	**137**
Punta de Choros	29° 14' 45.09"	71° 28' 7.14"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2019	2024	ptch	---
Coquimbo	29° 56' 58.89"	71° 20' 6.86"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	1999	2024	coqu	---
Puerto Aldea	30° 17' 32.28"	71° 36' 27.23"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2018	2024	ptal	---
Pichidangui	32° 8' 8.2"	71° 31' 45.49"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2010	2024	pich	---
Quintero	32° 46' 31.76"	71° 31' 31.51"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2011	2024	qtro	---

STATION	LATITUDE °S	LONGITUDE °W	TELEMETRY	SENSOR TYPE	REGISTER INTERVAL	SAMPLING INTERVAL	TRANSMIT INTERVAL	DATE INSTALL. SAT. PLATFORM	LAST LEVELLING	VLIZ/ IOC CODE	GLOSS ID
Valparaíso	33° 1' 39.62"	71° 37' 40.34"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	1999	2024	valp	**175**
San Antonio	33° 34' 53.81"	71° 37' 5.41"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	1999	2024	sano	---
Arch. Juan Fernández	33° 38' 9.74"	78° 49' 47.54"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	1999	2024	juan	**176**
Boyeruca	34° 41' 14.30"	72° 3' 28.30"	GPRS/ GOES	Pressure / Pressure	1 / 1 [min]	0.5 / 0.5 [s]	5 / 5 [min]	2021	2024	boye	---
Constitución	35° 21' 20.61"	72° 27' 25.31"	GPRS/ GOES	Radar / Radar	1 / 1 [min]	0.25 / 0.25 [s]	5 / 5 [min]	2010	2024	const	---
Coliumo	36° 32' 16.62"	72° 57' 25.7"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2018	2024	coli	---
Isla Quiriquina	36° 38' 10.11"	73° 3' 26.1"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2013	2024	quir	---
Talcahuano	36° 42' 3.36"	73° 6' 21.57"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	1999	2024	talc	---
Coronel	37° 1' 42.9" S	73° 9' 6.22"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2012	2024	crnl	---
Lebu	37° 35' 38.72"	73° 39' 50.8"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2010	2024	lebu	---
Nehuentue	38° 44' 59.73"	73° 24' 29.18"	GPRS/ GOES	Pressure / Pressure	1 / 1 [min]	0.5 / 0.5 [s]	5 / 5 [min]	2017	2024	ntue	---
Queule	39° 23' 51.42"	73° 12' 54.19"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2013	2024	quel	---
Corral	39° 53' 11.78"	73° 25' 38.92"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	1999	2024	corr	---
Bahía Mansa	40° 34' 51.39"	73° 44' 13.33"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2011	2024	bmsa	---
Puerto Montt	41° 29' 5.75"	72° 57' 39.09"	GPRS/ GOES	Radar / Radar	1 / 1 [min]	0.25 / 0.25 [s]	5 / 5 [min]	1999	2024	pmon	**178**
Ancud	41° 52' 2.55"S	73° 49' 58.37"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	1999	2024	ancu	---
Castro	42° 28' 51.23"	73° 45' 29.46"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2011	2024	cstr	---
Puerto Melinka	43° 53' 54.3"	73° 44' 53.61"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2011	2024	pmel	---
Puerto Chacabuco	45° 28' 1.5" S	72° 49' 12.15" W	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2001	2024	pcha	---

STATION	LATITUDE °S	LONGITUDE °W	TELEMETRY	SENSOR TYPE	REGISTER INTERVAL	SAMPLING INTERVAL	TRANSMIT INTERVAL	DATE INST. SAT. PLATFORM	LAST LEVELLING	VLIZ/ IOC CODE	GLOSS ID
Puerto Aguirre	45° 9' 52.42"	73° 31' 15.92"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2021	2024	pagi	---
Puerto Edén	49° 7' 47.23"	74° 24' 31.1"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2011	2024	pedn	---
Puerto Natales	51°43'44.90"	72°30'56.46"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2023	2024	pnat	---
Bahía Gregorio	52° 38' 53"	70° 12' 33"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2014	2024	greg	---
Caleta Meteoro	52° 57' 39.67"	74° 4' 19.76"	GOES/ BGAN	Pressure / Pressure	1 / 1 [min]	0.5 / 0.5 [s]	15 / 1 [min]	2011	2024	cmet	---
Punta Arenas	53° 7' 25.39"	70° 51' 43.18"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	2001	2024	ptar	---
Puerto Williams	54° 55' 58.35"	67° 36' 29.58"	GPRS/ GOES	Pressure / Radar	1 / 1 [min]	0.5 / 0.25 [s]	5 / 5 [min]	1999	2024	pwil	---
Base Prat	62° 28' 45.65"	59° 39' 43.29"	GOES/ BGAN	Pressure / Pressure	1 / 1 [min]	0.5 / 0.5 [s]	5 / 1 [min]	2013	2024	prat3	**189**
Base O'Higgins	63° 19' 13.13"	57° 53' 55.43"	GOES/ BGAN	Pressure / Pressure	1 / 1 [min]	0.5 / 0.5 [s]	5 / 1 [min]	2020	2024	ohig3	---

Status of GLOSS Stations in Chile

The seven Chilean stations that have been considered in the GLOSS core network are as follows:

GLOSS ID.	Location	Status	Photo
137	I. de Pascua Lat : 27º 09' S Lon: 109º 27' W	• Field Unit : VAISALA MAWS110 • Sea Level Sensors : - Differential Pressure Transducer DRUCK PTX1830 - Radar model VEGAPULSE62 • Record Spans : 1970 – 2025 • Gaps : 1980 ; 1982 ; 1983 • Monthtly Height Data up to 2024, has been sent to PSMSL • Hourly Height Data up to 2024, has been sent to UHSLC	
174	Antofagasta Lat : 23º 39' S Lon: 70º 24' W	• Field Unit : VAISALA MAWS110 • Sea Level Sensors : - Differential Pressure Transducer DRUCK PTX1830 - Radar model VEGAPULSE62 • Record Spans : 1970 – 2025 • Gaps : / • Monthtly Height Data up to 2024, has been sent to PSMSL • Hourly Height Data up to 2024, has been sent to UHSLC	
175	Valparaíso Lat : 33º 02' S Lon: 71º 37' W	• Field Unit : VAISALA MAWS110 Sea Level Sensors : - Differential Pressure Transducer DRUCK PTX1830 - Radar model VEGAPULSE62 • Record Spans : 1944 – 2025 • Gaps : 1971 - 1981 • Monthtly Height Data up to 2024, has been sent to PSMSL • Hourly Height Data up to 2024, has been sent to UHSLC	
176	Arch.J.Fernández Lat : 33º 37' S Lon: 78º 50' W	• Field Unit : VAISALA MAWS110 • Sea Level Sensors : - Differential Pressure Transducer DRUCK PTX1830 - Radar model VEGAPULSE62 • Record Spans : 1985 – 2025 • Gaps : / • Monthtly Height Data up to 2024, has been sent to PSMSL • Hourly Height Data up to 2024, has been sent to UHSLC	
177	I. San Félix Lat : 26º 17' S Lon: 80º 07' W	• Field Unit : VAISALA MAWS110 • Sea Level Sensors : - Differential Pressure Transducer DRUCK PTX1830 - Radar model VEGAPULSE62 • Record Spans : 1989 – 2025 • Gaps : / • Monthtly Height Data up to 2024, has been sent to PSMSL • Hourly Height Data up to 2024, has been sent to UHSLC	

178	P.Montt Lat : 41º 29' S Lon: 72º 58' W	• Field Unit : VAISALA MAWS110 • Sea Level Sensors : Radar (2) model VEGAPULSE62 • Record Spans : 1945 – 2025 • Gaps : / • Monthtly Height Data up to 2024, has been sent to PSMSL • Hourly Height Data up to 2024, has been sent to UHSLC	
189	P. Soberanía (Base Prat) Lat : 62º 29' S Lon: 59º 38' W	• Field Unit : VAISALA MAWS110 • Sea Level Sensors : Differential Pressure Transducer (2) DRUCK PTX1830 • Record Spans : 1984 – 2025 • Gaps : 2004 – 2008 • Station closed in January 2004 and reactivated in January 2009. • Monthtly Height Data up to 2024, has been sent to PSMSL • Hourly Height Data up to 2024, has been sent to UHSLC	

Data Streams

Chile contributes to GLOSS through SHOA, maintaining an adequate data streams to GLOSS archiving Centres.

We have delivered to Permanent Service for Mean Sea Level (PSMSL), the following monthly mean sea level data for some specific locations along the Chilean coast:

Location	Record
Arica	1992 – 2024
Iquique	1984 – 2024
Caldera	1992 – 2024
Talcahuano	1992 – 2024
Corral	1984 – 2024
Ancud	1999 – 2024
Puerto Melinka	2011 – 2024
Punta Arenas	1988 – 2024
Puerto Williams	1971 – 2024

Additionally, oceanographic data and related information obtained by various oceanographic research institutions in Chile are archived at SHOA in the National Hydrographic and Oceanographic Center (CENDHOC). Monthly mean sea level data for the all sea level network are available at the website: **http://bit.ly/UCRiSo .**

Future Plans

Given the importance of sea level stations for tsunami observation and monitoring, it is necessary for the network to be fully operational 24 hours a day, 7 days a week.

In Chile, tsunami monitoring is carried out by dividing the national territory into 21 zones or blocks (Table 1, Figure 4). By 2030, each block should have at least two sea level stations. In February 2025, a second station was installed in Arica (Figure 5), so the Arica block (B1) will have two fully operational stations and their data can be downloaded from the VLIZ/IOC site.

Fig. 4. Integrated Tsunami Warning and Prediction System (SIPAT) Blocks

Fig. 5. Arica 2 (Sitio 7), Inst. Feb. 2025.