Report to the Thirteenth Session of the IOC Group of Experts On the Global Sea Level Observing System (GLOSS)

Chilean Sea Level Network: Current State

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Introduction

Since 1941, the Chilean Navy Hydrographic and Oceanographic Service (SHOA) has established a sea level network that currently comprises 40 sea level recorders covering a long coast of more than 4000 kilometers in the mainland, as well as in some islands and in the Antarctic Continent (see fig.1).

During the years 2012 and 2013, six new stations have been installed in order to increase the densification of sea level stations along the coast of Chile, particularly in areas where population centers are located and nearby country's main port. Up to date, 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.

Regarding telemetry systems, GOES remains the main data transmission system and text messages through cell phone GPRS network, is used as a secondary telemetry system. It should be noted that sea level stations of Caleta Meteoro (Lat: 52º 58' 00"S ; Long: 74º 03' 58"W) and Puerto Soberanía (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.

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 were installed more powerful servers to implement a new data administration and visualization system, strengthening the capabilities in data availability and response within the framework of the National Tsunami Warning System.

Currently, San Pedro, (Lat: 47º 43'S ; Long: 74º 54'W) and Rada Covadonga, (Lat: 63º 19'S ; Long: 57º 55'W), are the only sea level stations operating with AANDERAA devices, being the data downloaded in those places during annual field campaigns.

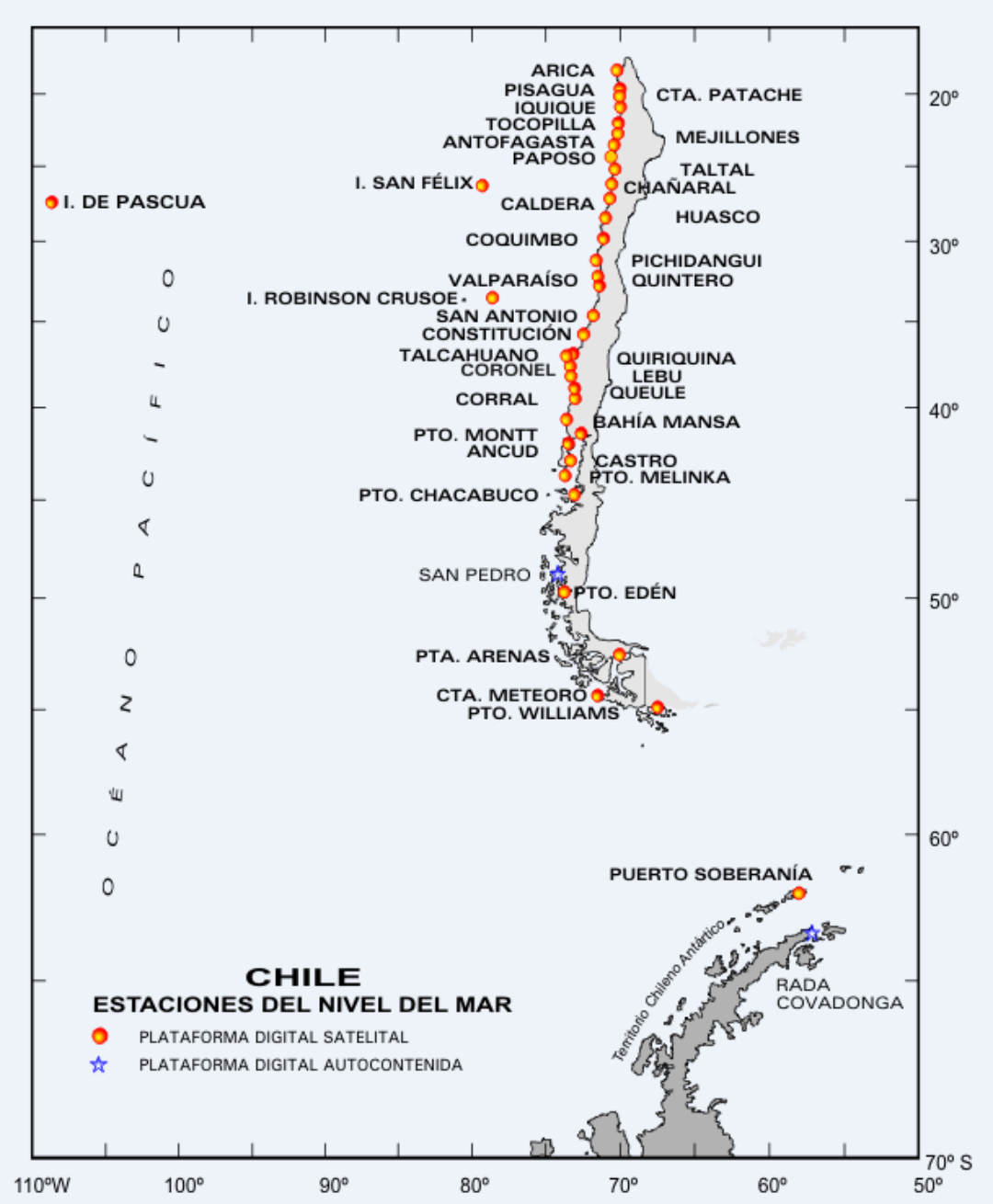

Figure 1 : Chilean Sea Level Network

The new stations capabilities have allowed us to achieve a reliable network supplying data for operational and scientific purposes.

The data collected at the Chilean Sea Level Network are available through the website developed and maintained by VLIZ for UNESCO/IOC. Additionally, data can be accessed in real time at SHOA's website through the link: http://www.shoa.mil.cl/mareas/mapa.php

Chilean Sea Level Stations with real time telemetry

The table below sumarises the geographic location and year of installation of the data collection platforms with real time sea level data transmissions.

Station	Latitude	Longitud	Date of installation Satellite platform
Arica	18° 28 '33"	070° 19' 23"	1999
Pisagua	19° 35' 48"	070° 12' 49"	2010
Iquique	20° 12' 16"	070° 08' 52"	1999
Patache	20° 48' 01"	070° 11' 39"	2011
Tocopilla	22° 05' 35"	070° 12' 53"	2010
Mejillones	23° 05' 51"	070° 27' 03"	2011
Antofagasta	23° 39' 11"	070° 24' 16"	1999
Paposo	25° 00' 32"	070° 28' 07"	2013
Taltal	25° 24' 26"	070° 29' 23"	2010
Isla San Félix	26° 17' 32"	080° 06' 31"	1999
Isla de Pascua	27° 09' 17"	109° 28' 22"	1999
Chañaral	26° 21' 24"	070° 38 46"	2012
Caldera	27° 03' 52"	070° 49' 29"	1999
Huasco	28° 27' 39"	071° 13' 25"	2010
Coquimbo	29° 57' 00"	071° 20' 07"	1999
Pichidangui	32° 08' 08"	071° 31' 46"	2010
Isla Robinson Crusoe	33° 38' 09"	078° 49' 47"	1999
Quintero	32° 46' 32"	071° 31' 31"	2011
Valparaíso	33° 01' 38"	071° 37' 33"	1999
San Antonio	33° 34' 56"	071° 37' 08"	1999
Constitución	35° 21' 21"	072° 27' 28"	2010
Talcahuano	36° 41' 43"	073° 06' 23"	1999
Isla Quiriquina	36° 38' 10"	073° 03' 25"	2013
Coronel	37° 01' 44"	073° 09' 07"	2012
Lebu	37° 35' 39"	073° 39' 50"	2010
Queule	39° 23' 52"	073° 12' 54"	2013
Corral	39° 52' 42"	073° 25' 22"	1999
Bahía Mansa	40° 34' 51"	073° 44' 14"	2011
Puerto Montt	41° 29' 06"	072° 57' 39"	1999
Ancud	41° 52' 01"	073° 49' 55"	1999
Castro	42° 28' 50"	073° 45' 30"	2011
Melinka	43° 53' 54"	073° 44' 54"	2011
Puerto Chacabuco	45° 28' 02"	072° 49' 13"	2001
Puerto Edén	49° 07' 54"	074° 25' 19"	2011
Punta Arenas	53° 07' 25"	070° 51' 37"	2001
Caleta Meteoro	52° 58' 00"	074° 03' 58"	2011
Puerto Williams	54° 56' 00"	067° 36' 36"	1999
Base Prat, Antártica	62° 28' 00"	059° 39' 00"	2013

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
137	I. 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 – 2012 • Gaps : 1980 ; 1982 ; 1983 • Monthtly Height Data up to 2012, has been sent to PSMSL • Hourly Height Data up to 2012, has been sent to UHSLC
74	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 – 2012 • Gaps : • Monthtly Height Data up to 2012, has been sent to PSMSL • Hourly Height Data up to 2012, 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 – 2012 • Gaps : 1971 - 1981 • Monthtly Height Data up to 2012, has been sent to PSMSL • Hourly Height Data up to 2012, has been sent to UHSLC
176	I.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 – 2012 • Gaps : • Monthtly Height Data up to 2012, has been sent to PSMSL • Hourly Height Data up to 2012, 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 – 2012 • Gaps : • Monthtly Height Data up to 2012, has been sent to PSMSL • Hourly Height Data up to 2012, has been sent to UHSLC

GLOSS ID.	Location	Status
178	P.Montt Lat : 41º 29' S Lon: 72º 58' W	• Field Unit : VAISALA MAWS110 • Sea Level Sensors : - Differential Pressure Transducer DRUCK PTX1830 - Radar model VEGAPULSE62 • Record Spans : 1945 – 2012 • Gaps : • Monthtly Height Data up to 2012, has been sent to PSMSL • Hourly Height Data up to 2012, 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 – 2012 • Gaps : 2004 – 2008 • Station closed in January 2004 and reactivated in January 2009. Data 2009-2012 is under quality control. • Monthtly Height Data up to 2003, has been sent to PSMSL • Hourly Height Data up to 2003, has been sent to UHSLC