

Report to the Ninth 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 Hydrographic and Oceanographic Service of the Chilean Navy (SHOA) has established a sea level network that actually comprises 19 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 1999 an extensive hardware upgrading process was initiated. It considered the deployment of 18 data collecting platforms with satellite transmission data capabilities (VAISALA model 555C) and 1 self-contained platform (AANDERAA model 3634) that replaced most of the old dry purged recording tide gauge. At the moment, Rada Covadonga, (Lat. 63° 19'S ; Long. 57° 55'W) is the only sea level station operating with AANDERAA devices.



Figure 1 : Chilean Sea Level Network

Rada Covadonga Sea Level Station

Chile has conducted sea level observations in the Antarctica since 1947, initially with the installation of short period stations during summer, giving rise to records of greater extension once the experience in the installation and operation of tide instruments in this hostile environment was acquired. Therefore, in 1983, tide gauge station Puerto Soberanía (Base Prat) was settled which operating uninterruptedly became part of the national tide gauge network until the cease of its operation in January , 2004.

The greater facilities found for the installation and maintenance of tide instruments, determined the transfer of implements to Bernardo O'Higgins Antarctic Base located in Rada Covadonga. This station was incorporated in December, 2004 to the national tide gauge network replacing the old station of Puerto Soberanía. The maintenance of this station will be carried out annually during the hydrographic campaigns that are developed in the Antarctica. Figure 2 shows a view of the Base and pier in which the tide instrument was installed.

Previous sea level observations in this location were collected in 1975 during the experimental operation of tide instruments together with other short period observations obtained during some more recent hydrographic campaigns.



Figure 2 : Rada Covadonga Antarctic Base.

Status of GLOSS Stations in Chile

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

GLOSS ID.	Location	Status
137	I. Pascua Lat : 27° 09' S Lon: 109° 27' W	<ul style="list-style-type: none"> • Field Unit : Currently VAISALA 555C • Sea Level Sensor : Currently Differential Pressure Transducer DRUCK PTX 1830 Two acoustic sensors Aquatrak • Record Spans : 1970 – 2003 • Gaps : 1980 ; 1982 ; 1983 • Monthly Height Data up to 2002, has been sent to PSMSL • Hourly Height Data up to 2002, has been sent to UHSLC
74	Antofagasta Lat : 23° 39' S Lon: 70° 24' W	<ul style="list-style-type: none"> • Field Unit : Currently VAISALA 555C • Sea Level Sensor : Currently Differential Pressure Transducer DRUCK PTX 1830 • Record Spans : 1970 – 2003 • Gaps : • Monthly Height Data up to 2002, has been sent to PSMSL • Hourly Height Data up to 2002, has been sent to UHSLC
175	Valparaíso Lat : 33° 02' S Lon: 71° 37' W	<ul style="list-style-type: none"> • Field Unit : Currently VAISALA 555C • Sea Level Sensor : Currently Differential Pressure Transducer DRUCK PTX 1830 Two acoustic sensors Aquatrak • Record Spans : 1944 – 2003 • Gaps : 1971 - 1981 • Monthly Height Data up to 2002, has been sent to PSMSL • Hourly Height Data up to 2002, has been sent to UHSLC • CGPS data up to 2004, has been sent to UH-IGP
176	I.J.Fernández Lat : 33° 37' S Lon: 78° 50' W	<ul style="list-style-type: none"> • Field Unit : Currently VAISALA 555C • Sea Level Sensor : Currently Differential Pressure Transducer DRUCK PTX1830 • Record Spans : 1985 – 2003 • Gaps : • Monthly Height Data up to 2002, has been sent to PSMSL • Hourly Height Data up to 2002, has been sent to UHSLC
177	I.San Félix Lat : 26° 17' S Lon: 80° 07' W	<ul style="list-style-type: none"> • Field Unit : Currently VAISALA 555C • Sea Level Sensor : Currently Differential Pressure Transducer DRUCK PTX 1830 • Record Spans : 1989 – 2003 • Gaps : • Monthly Height Data up to 2002, has been sent to PSMSL • Hourly Height Data up to 2002, has been sent to UHSLC

GLOSS ID.	Location	Status
178	P.Montt Lat : 41° 29' S Lon: 72° 58' W	<ul style="list-style-type: none"> • Field Unit : Currently VAISALA 555C • Sea Level Sensor : Currently Differential Pressure Transducer DRUCK PTX 1830 • Record Spans : 1945 – 2003 • Gaps : • Monthly Height Data up to 2002, has been sent to PSMSL • Hourly Height Data up to 2002, has been sent to UHSLC
180	I.D.Ramírez Lat : 56° 30' S Lon: 68° 43' W	<ul style="list-style-type: none"> • Non – Operational (closed in 1998) • Record Spans : 1991 – 1997 • Gaps : • Monthly Height Data up to 1997, has been sent to PSMSL • Hourly Height Data up to 1997, has been sent to UHSLC
189	P. Soberanía (Base Prat) Lat : 62° 29' S Lon: 59° 38' W	<ul style="list-style-type: none"> • Non – Operational (closed in January 2004) • Record Spans : 1984 – 2003 • Gaps : • Monthly Height Data up to 2002, has been sent to PSMSL • Hourly Height Data up to 2002, has been sent to UHSLC

Remarkable issues

GLOSS 137

Eastern Island holds our standard configuration of sensors and also has been equipped with two acoustic sensors since 2002 under responsibility of the University of Hawaii.

During 2004 it has operated with gaps as a result of power supply problems.

GLOSS 174

An ultrasonic wind sensor has been incorporated during the last semester of 2004.

GLOSS 175

Valparaíso holds our standard configuration of sensors. This station is also equipped with a shaft encoder and two acoustic sensors since 1998 under responsibility of the University of Hawaii.

GLOSS 180

Diego Ramirez Island is a non-operational station. Equipment was removed during 1998 after informing NOAA about logistic problems in maintaining SHOA's permanent personnel staff in this island.

GLOSS 189

Puerto Soberanía is a non-operational station. The Aanderaa instrument was removed in January 2004 as mentioned above.

Data Streams

Chile contributes to GLOSS maintaining adequate data streams to GLOSS archiving Centres.

We have delivered the data up to 2002 according the 4 main data streams in GLOSS:

- 1) Monthly mean Sea Level to PSMSL
- 2) Hourly Heights in delayed mode to UHSLC
- 3) Fast Higher frequency to UHSLC
Data collected at all the Chilean stations are being downloaded in near real-time by UHSLC.
- 4) GPS data collected in Valparaíso station (GLOSS 175) are sent to University of Hawaii.

Future Plans

The installation during 2005 at SHOA's facilities of a VAISALA Direct Readout Ground Station (DRGS).

Once the technical details have been evaluated, we will schedule the installing at San Pedro sea level station (Lat. 47° 44'S ; Long. 74° 54'W) of a secondary sea level sensor which probably could be a KALESTO radar sensor. Since its installation in 1995, this station has operated with several interruptions, mainly due to the short daily radiation to provide adequate energy for battery charging and also to damages suffered by the DRUCK sensor which is frequently cut because of sea storm in this part of the Chilean coast.