

“CHILEAN PART OF SIRGAS REFERENCE FRAME, REALIZATION, ADOPTION, MAINTENANCE AND ACTUAL STATUS”

*Geodesy for Planet Earth
IAG 2009, Buenos Aires*

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- Dr. Juan Báez jbaez@udec.cl, Universidad de Concepción, Chile

- The Military Geographic Institute of Chile (IGM) is the official organization that represents the Chilean State in all matters involving cartography, surveying and the management of the National Geodetic Network.
- Since 1993 the IGM has been an active member of SIRGAS, participating in all activities that this project has carried out to establish the SIRGAS network in the continent.
- In 1993, the IGM, together with UNAVCO, started up the Central Andes Project (CAP), a geophysics network that has been the basis for geodetic development in Chile over recent years. Now the IGM is continuing to work with The Ohio State University on maintaining the network and monitoring the deformations of the central Andes.
- In 2005, the IGM agreed with the Geomatics Department of the University of Concepcion (Dr. Juan Baez) to perform a project to improve the maintenance and processing the CGPS network and to carry out geodesic projects of scientific interest.

Legal Aspects

- Currently the proposal for a Law to make SIRGAS the official reference system of Chile is being processed. Together with this, those involved with geospatial data are working towards the standardization of that data in terms of ensuring that all geo-information projects financed by the state will be referred to the same GRS. (SIRGAS)



The screenshot shows the Snit website interface. At the top, there is a navigation menu with items: ¿Qué es el Snit?, Presentación, Publicaciones, Vínculos, Sala de Prensa, Descargas, Acceso a Discapacitados, and a search bar. Below the menu, there are several sections: 'Geoportal Chile', 'Catálogo Nacional', 'Suscribirse al Newsletter', 'Comunidad Geoespacial', and 'Galería de Fotos'. The main content area features a news article titled 'Durante la semana del 10 al 14 de agosto se realizó la Novena Conferencia Cartográfica Regional de las Naciones Unidas' with a sub-headline 'Bajo el título de "Construyendo Infraestructuras Geoespaciales en apoyo a la Prevención y Administración de Desastres", más de veinte países e Instituciones Internacionales, se reunieron en la sede central de las Naciones Unidas en Nueva York. El Secretario Ejecutivo del SNIT fue elegido vicepresidente de la Conferencia.' There are also smaller news snippets about the Snit website and a new site for Aysén.

www.snit.cl

“Vertical Control” Geodetic Networks

a) Levelling Network



- 12,000 kilometers have been surveyed since 1948 to date.
- We have the altitude values for the whole network loaded into the relevant digital media.
- The geographic position has been determined in 90% of the monuments.
- Within the agreements made in the framework of the SIRGAS project, the IGM has made international connections of its survey lines with Argentina —
- For the year 2010 it is planned to set up four more connections with Argentina and Bolivia —

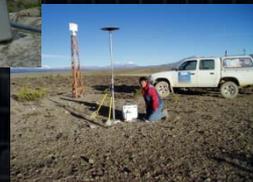
b) Gravity Network



- Network made up of 54 absolute gravity points.
 - NGA (USA) 4 stations (2000)
 - IRD (France) 50 stations (2001 - 2005)
- Network made up of 70 relative gravity points
 - IBGE - USP (Brazil)

OBJECTIVE

- Supply data to the geoidal models.
- Provide data to the International Gravity Bureau (IGB - France).



“Horizontal Control” Geodetic Networks

a) Densification of the Network



- Name: National Geodesic Network SIRGAS-Chile.
- Geodesic Datum : ITRF 2000, epoch 2002.0
- Ellipsoid: GRS80
- Network made up of 650 points at monuments, measured 48 hours and processed with BERNESE.
- CD SIRGAS-Chile with information about the Network (monograph records) for users.
- Book RGN SIRGAS CHILE available to users with the history of the National Geodetic Network.
- Network made more dense, annually, by the IGM and by the “Joint Campaigns” in which we invite Chilean users to participate in the measurements of terrain in places chosen by them, following IGM measurement protocols. The IGM processes the data and sends certificates of the coordinates to the participants, without cost to them, thus ensuring that projects in Chile are georeferenced in SIRGAS.



IDENTIFICACION DEL USUARIO			
MONOGRAFIA DE SERVICIO GEODÉSICO			
USUARIO	LATITUD	SEÑAL	PROYECTO
DESIGNACION	30° 30'	00° 00'	NOMBRE ESTACION
Nombre:	PUNTA ARENAS - TORRE DEL VIENTO		
Fecha de Medición:	08	1982	
Proyecto de Medición:	PUNTA ARENAS		
Medición:	01	NOVIEMBRE 2002	
Medición:	02	NOVIEMBRE 2002	
PROYECTO:			
Descripción: Torre del Viento			
Objetivo: Establecer un punto de referencia geodésico en Punta Arenas.			
Observaciones: Se utilizó un receptor GPS Garmin 120L y un receptor SIRGAS Chile.			
Elaborado por: IGM			



b) CGPS Network



- Network of 13 CGPS stations operating at this date.
- 10 stations IGS and SIRGAS-CON.
- 9 CGPS stations managed by IGM with a daily download of data via Internet.
- Soon, a web page will be set up for placing at the disposal of users the daily data.
- The IGM, together with the Ohio State University, has established 7 stations since 1996. Initially this was for purposes related only to geophysics, but over time these were added to the IGS network and then to SIRGAS-CON.

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- Thanks Dr. Bevis !!!!



Projects 2010 - 2012

SISGEO Network



• In 2009, the Government of Chile has approved the proposal by the Seismological Service of the University of Chile to strengthen this by obtaining a national seismic coverage providing information that is close to real-time to Chilean institutions, also creating for the medium and long term databases of high quality and easy access that contribute to the knowledge of the danger and to reducing the seismic hazard to the country. . (Tsunamis, tectonic faults, seismic cycle, etc..)

In order to correctly identify the danger and how to reduce and manage the Seismic Hazard, a network of instruments will be installed with a nation-wide coverage made up of the following elements:

Seismological Network

- 65 broad band seismological stations
- 140 Global Positioning System monitoring stations (GPS L1/L2)
- 2 portable networks for support during seismic crises (40 full seismological stations and 16 GPS L1/L2 receivers)

Infrastructure and Ground Network

- 200 Surface *accelerometers*
- 1 Portable rapid-response network of *accelerometers*

from After two years 2010, when the project starts, the country will have a working network throughout the nation.

SISGEO Network



Work Program

- 2009 - IGM signs an agreement to become position of the processing and to give reference of the SISGEO Network.
- 2009 - First campaign to survey and select locations, acquisition of equipment.
- 2010 - Second survey campaign will come.
- 2010 - Installation of 40 "SISGEO" stations will occur.
- 2011 - Installation of 100 "SISGEO" stations.
- 2012 - All "SISGEO" Network in operation.
- 2012 - Incorporation of 25 SISGEO stations to the SIRGAS-CON Network.

Development of the CGPS network in the next few years.

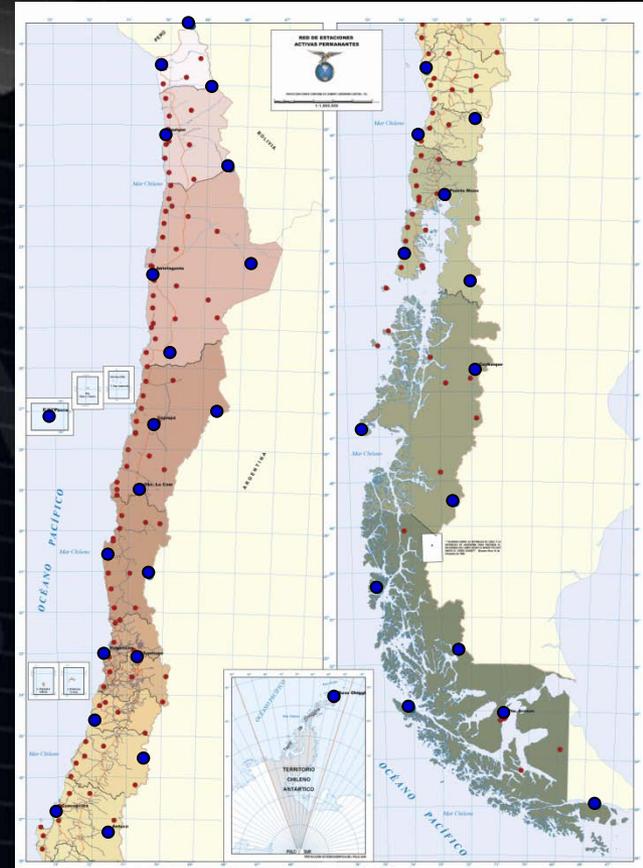
2009



- 13 CGPS in Chile
- 10 CGPS in SIRGAS-CON



2012



- 153 CGPS in Chile
- 35 CGPS in SIRGAS-CON

Taking advantage of this infrastructure of the CGPS network, the IGM has begun to work on 2 geodetic projects of importance at national and international level; these are:

- Official application to become in SIRGAS Experimental Processing Center.
- Performance of the project for processing data on-line for users in Chile using the IGM web site, in order to provide modern tools for National network users to work under the same standards of accuracy and the same reference system, thus ensuring homogeneous coordinates in all projects performed in Chile.

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THANKS FOR YOUR ATTENTION !!!!

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Processing centers

Antofagasta

Santiago (CSN)

Concepción (UDEC)

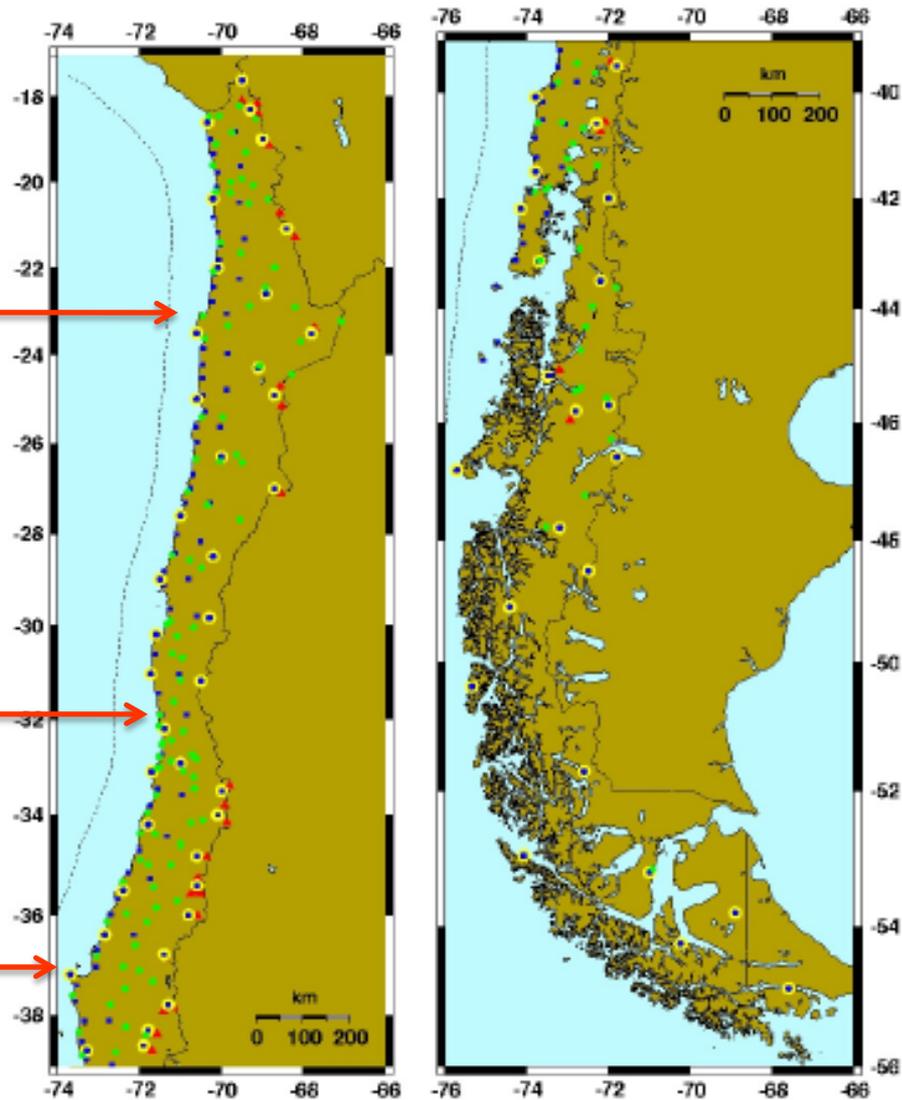


Figura 2. Esquema General Preliminar de Ubicación de Instrumentos y Redes. En esta figuras los puntos azules indican ubicación de instrumentos GPS, lo círculos amarillos indican ubicación de equipos sísmológicos integrados, los puntos verdes estaciones de acelerógrafo y los triángulos rojos la ubicación de volcanes activos. No se indican en la figura las estaciones de Isla de Pascua y Juan Fernández.