



UN-GGIM:Americas
REGIONAL COMMITTEE OF UNITED NATIONS
ON GLOBAL GEOSPATIAL INFORMATION
MANAGEMENT FOR THE AMERICAS

9° SESSION

UN-GGIM: Americas

SIRGAS and GRFA WG UN-GGIM:Americas interactions for sustainable geodesy in the Americas

Sonia Costa

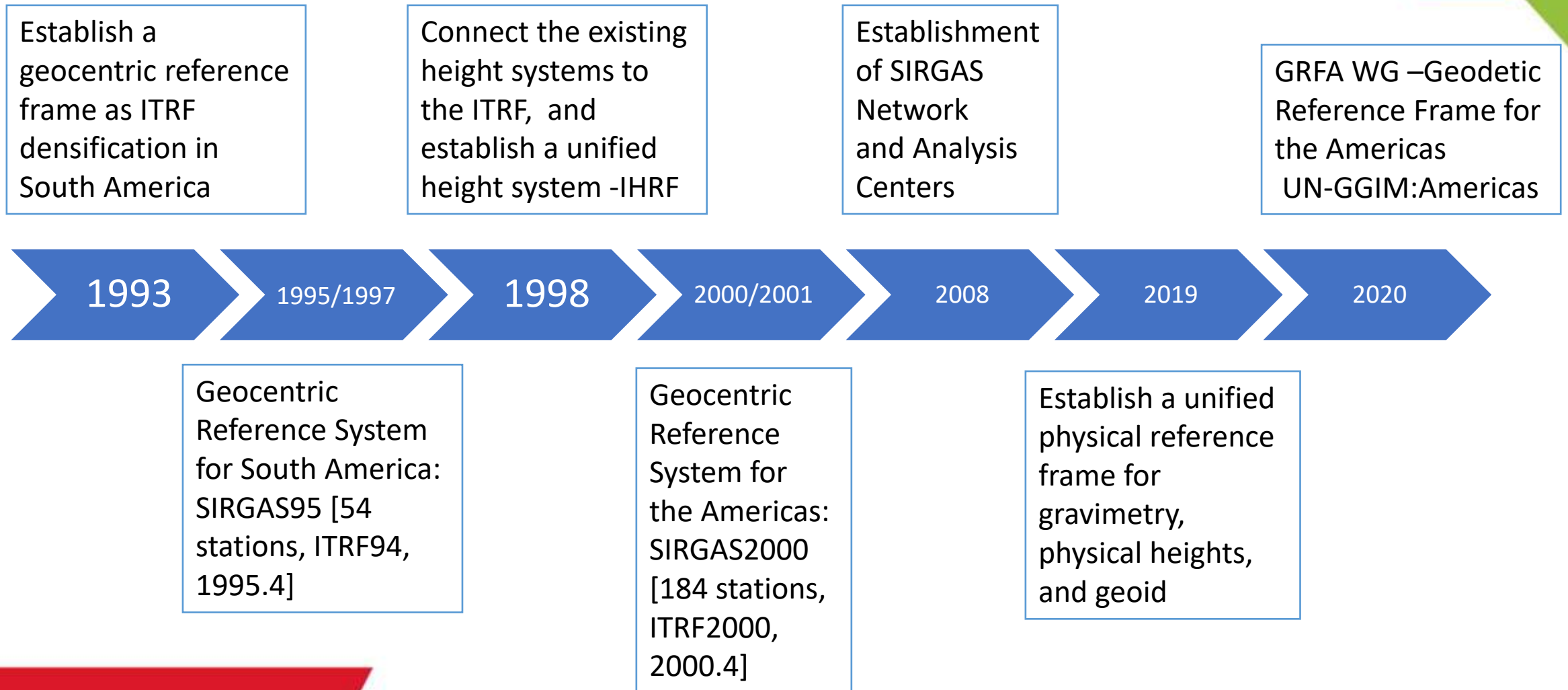
Session 5



November 28, 29 and 30
Santiago de Chile, ECLAC

SIRGAS - Main objectives /chronology

22 members



GRFA WG ToR (approved sept. 2020)

General Objectives

- 1.1.1. To support the Nations of the Americas in response to the United Nations General Assembly Resolution entitled “A Global Geodetic Reference Frame for Sustainable Development” (A/RES/69/266) under the recommendations of the United Nations Global Geospatial Information Management (UN-GGIM) Subcommittee on Geodesy (UN-GGIM SCoG), and the scientific guidelines issued by the International Association of Geodesy (IAG) and Geocentric Reference System for the Americas (SIRGAS).
- 1.1.2. To coordinate and assist Member States’ efforts to ensure the sustainability and enhancement of the GRFA, as a crucial enabler of spatial data interoperability, disaster risk mitigation, and sustainable development.
- 1.1.3. The Working Group will be called the **Geodetic Reference Frame for the Americas (GRFA) Working Group** of the Regional Committee of United Nations on Global Geospatial Information Management for the Americas (UN-GGIM: Americas) and abbreviated to only GRFA Working Group.

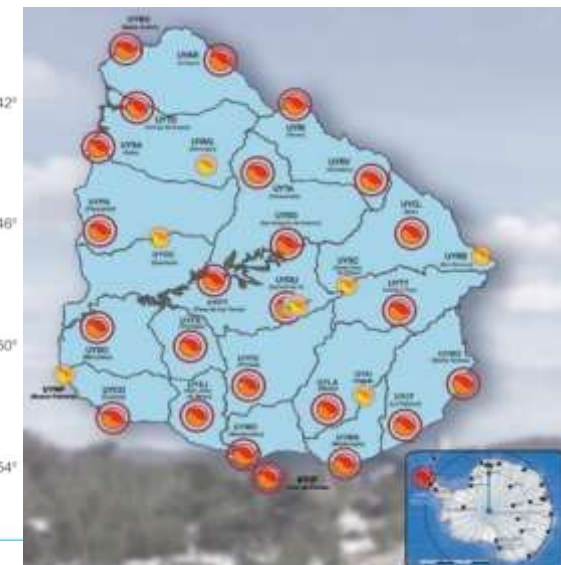
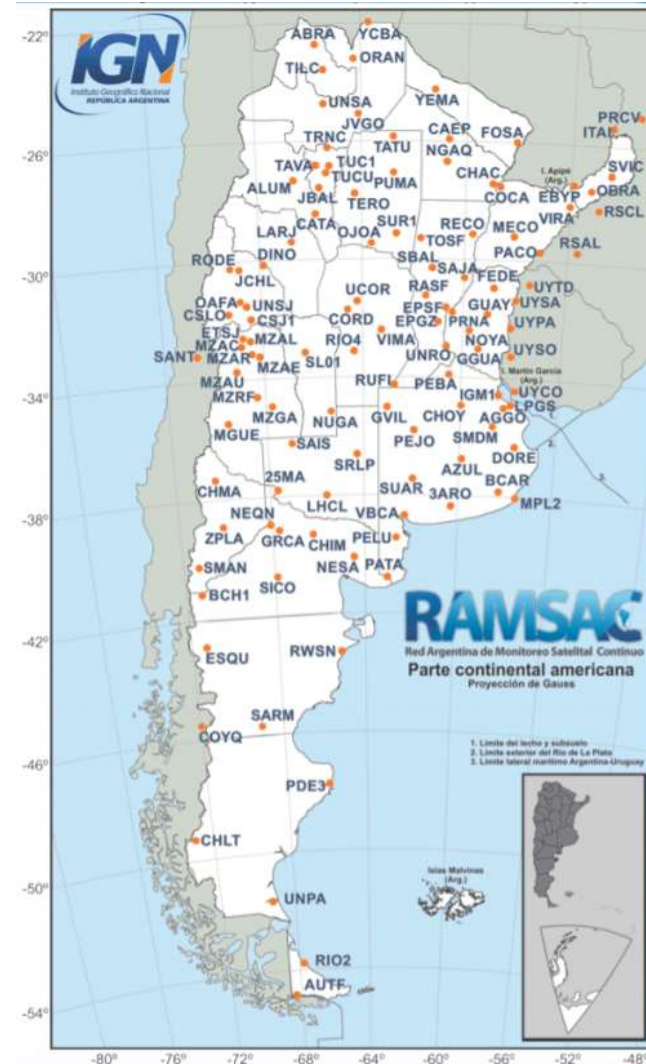
Geodetic Infrastructure

GNSS CORS Networks

GNSS Data Centers

GNSS Analysis Centers

Argentina	RAMSAC
Bolivia	MARGEN
Brasil	RBMC
Chile	IGS, CSN, CAPES
Colombia	MAGNA-ECO
Costa Rica	RGNA-CR
Ecuador	REGME
México	RGNA
Panamá	Panamá-CORS
Perú	REGPMOC
Uruguay	REGNA-ROU

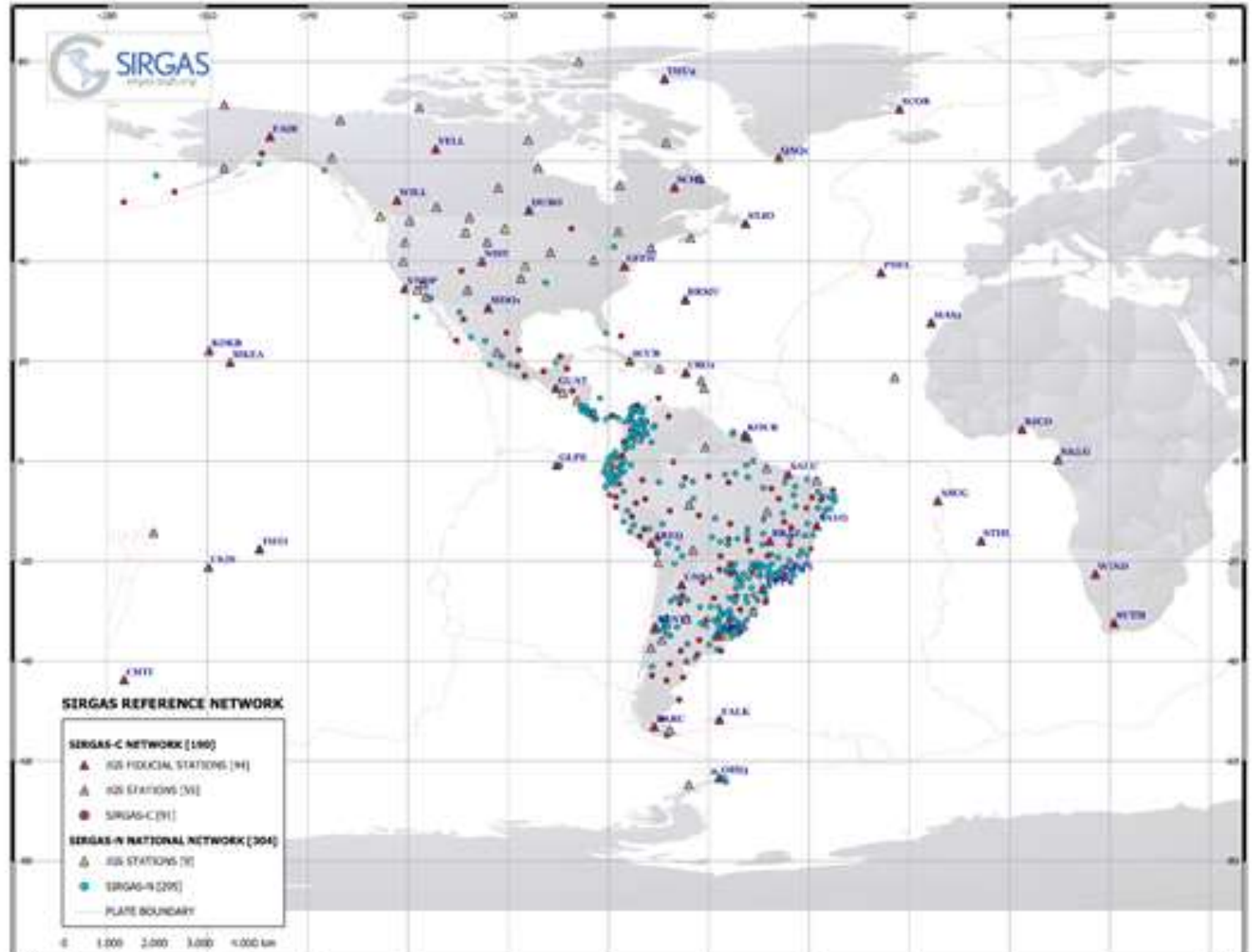


SIRGAS Reference Network - Geodetic Infrastructure

To establish a regional densification of the *International Terrestrial Reference Frame - ITRF*

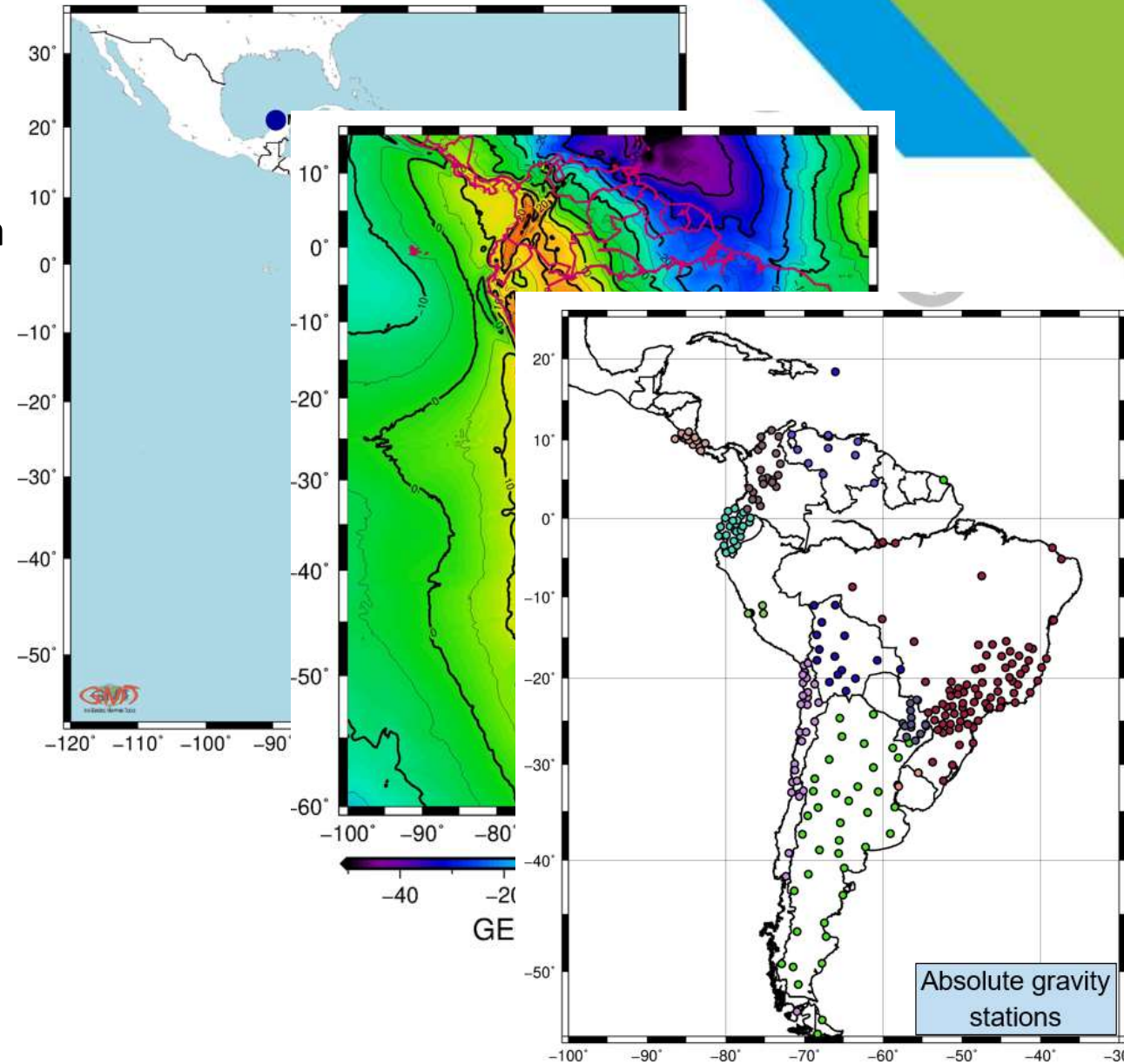
Analysis Centers: maintain and to ensure the long-term stability of the SIRGAS reference frame

- GNSS data from 493 Stations
- Analysis
 - Ten GNSS analysis centres
 - Two GNSS combination centres
 - One analysis centre for the Neutral Atmosphere
- Products
 - Combined tropospheric Zenith Path Delays (hourly sampling rate)
 - Weekly station positions aligned to the IGS reference frame – IGB14
 - Cumulative solutions (station velocities, time series, post-seismic functions)
 - Velocity models VEMOS



Geodetic Infrastructure : Physical heights and Geoid modelling

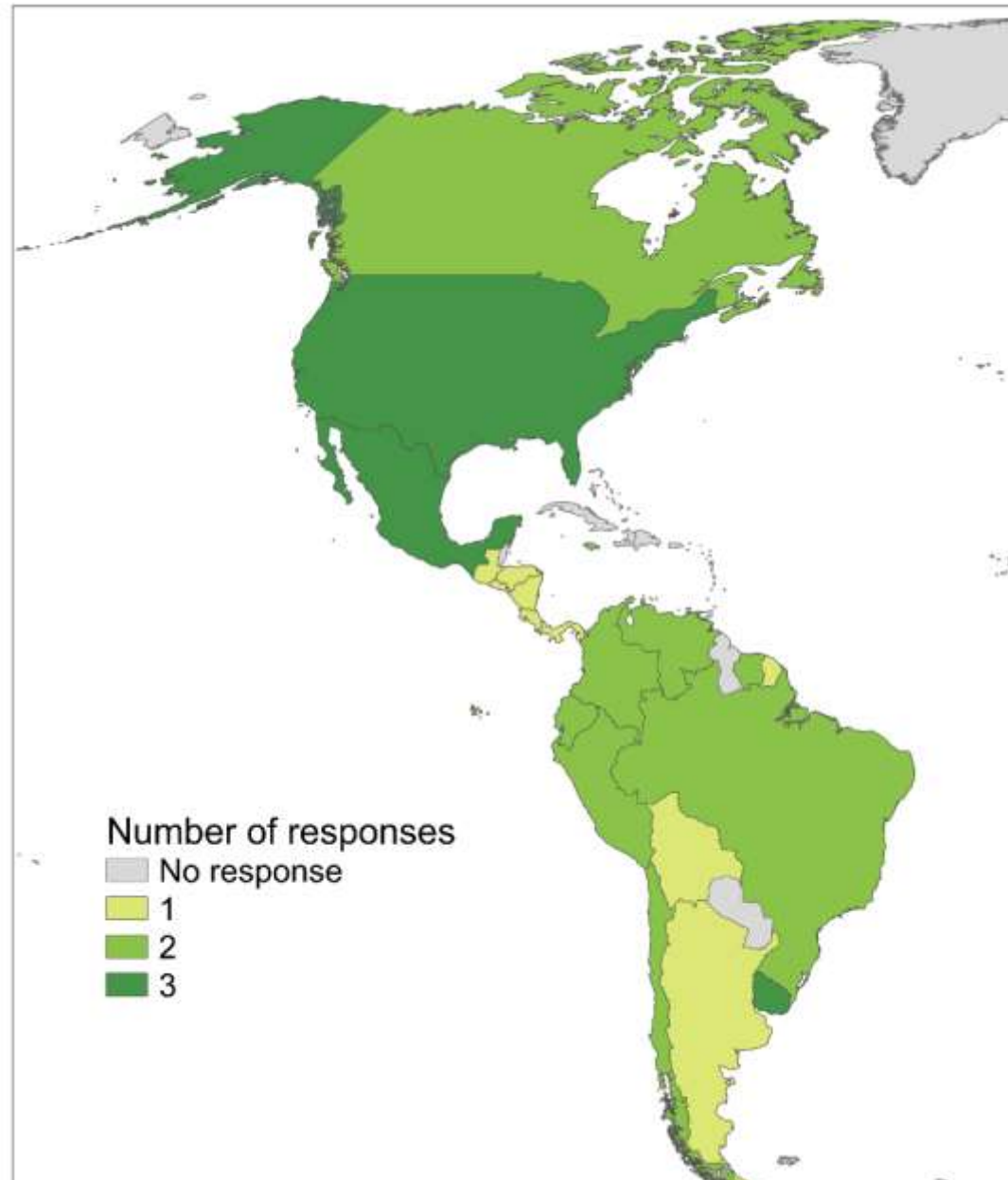
- **Objectives:**
- To provide a reference standard for the precise determination of physical heights establishing a regional densification of *International Height Reference Frame – IHRF*;
- To provide precise regional/national geoid models to support GNSS/levelling applications with high reliability
- To provide a reference standard for terrestrial gravimetry establishing a regional reference network of absolute gravity stations (as a densification of the future *International Terrestrial Gravity Reference Frame – ITGRF*)



Online survey about geodetic capacity of each Member State

- Geodetic Capacity Development Survey to assess the competency level of the Member States and their training and education necessities (until august 2022)
- Information about online and real time services, as well as, CORS networks
- **Inventory:**

<https://sirgas.ipgh.org/en/national-densifications/>



- Antigua and Barbuda
- Bahamas
- Barbados
- Belize
- Cuba
- Dominica
- Dominican Republic
- Grenada
- Guyana
- Haiti
- Paraguay
- St Lucia
- St. Vincent and the Grenadines
- St. Kitts and Nevis
- Trinidad and Tobago

Free Web Services, online GNSS post-processing Coordinates in the official reference frame



- ✓ PPP-AR (Argentina)

<https://www.ign.gov.ar/ppp/auth/login>

- ✓ IBGE-PPP (Brasil)

<http://www.ppp.ibge.gov.br/ppp.htm>

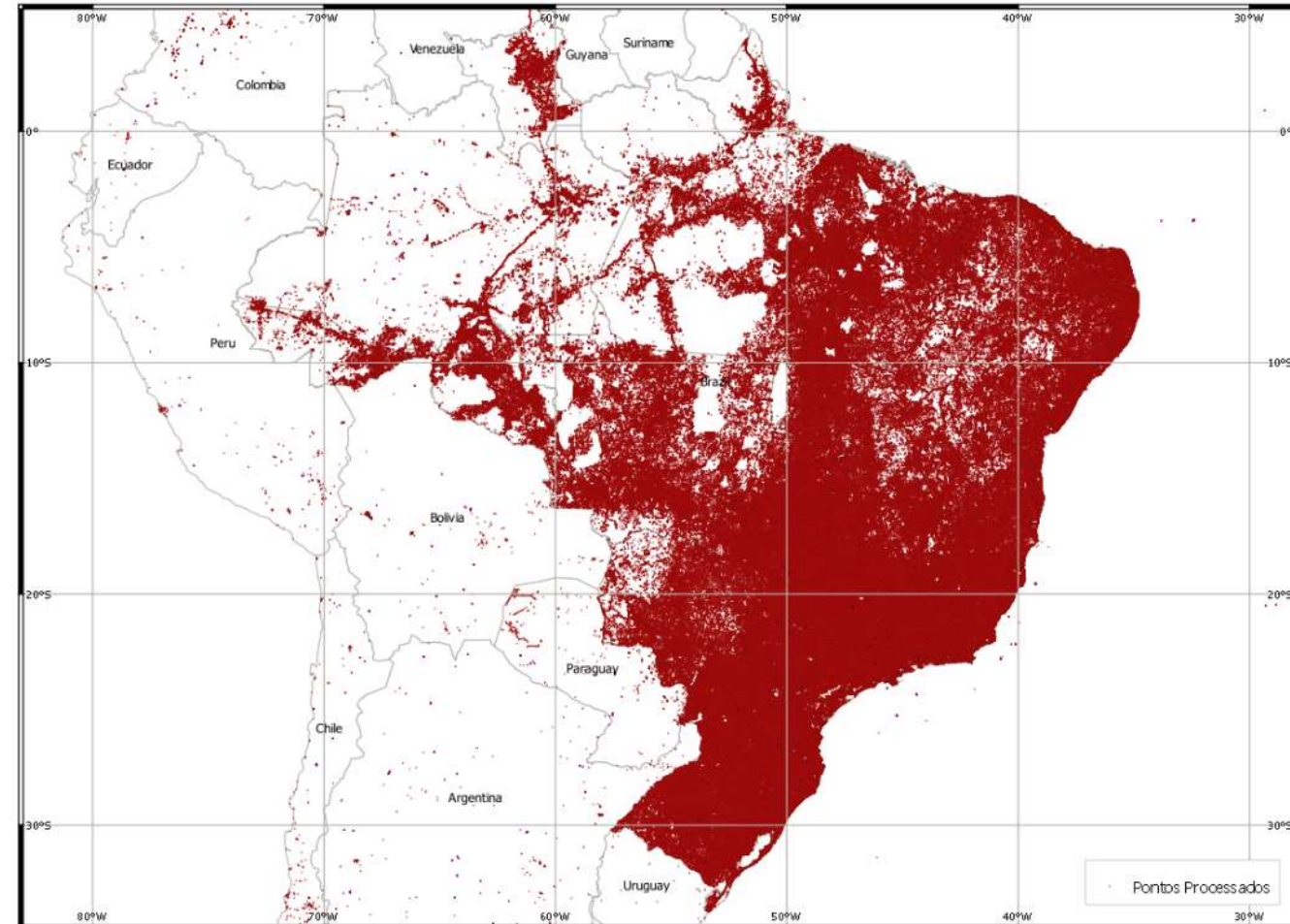
- ✓ OPUS (Estados Unidos)

<https://www.ngs.noaa.gov/OPUS/>

- ✓ CSRS-PPP (Canadá)

[https://webapp.geod.nrcan.gc.ca/geod/tools-
outils/ppp.php](https://webapp.geod.nrcan.gc.ca/geod/tools-
outils/ppp.php)

IBGE-PPP: Localização dos pontos processados - Abril de 2009 a Agosto de 2022 - Cerca de 3,5 milhões de pontos processados



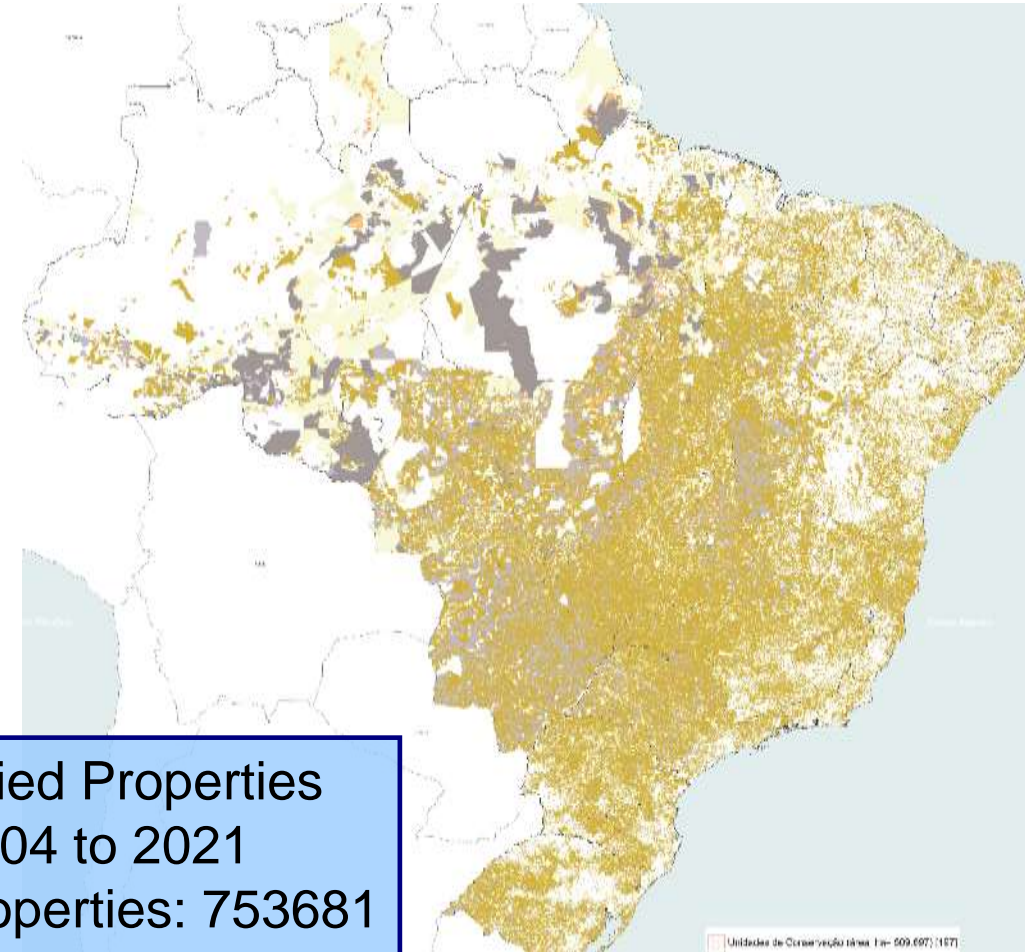
Geospatial information interoperability for the societal benefits

Land Reform

SIGEF - Sistema de Gestão Fundiária (Land Management System)

- ✓ **Brazilian Territorial Area 8.515.767,049 km²**
- ✓ **INCRA** (Instituto Nacional de Colonização and Reforma Agrária) - National Cadastre for Rural Properties
- ✓ **IBGE responsibility**: Brazilian Geodetic System
- ✓ **Law 10267/01** – Federal law that obly all owner of a rural property provide a georeferenced planta(screch) when any prodedure related to notariat must be done.
- ✓ The georeferencing must be connected to Brazilian Geodetic System.

Private certified 
Public certified 



Recent training and capacity building

Frequent *on-line* workshops, webinars

- 6 in 2020
- 4 in 2021
- 10 in 2022

Taller sobre Sistemas de Referencia
 Profesor: Hermann Drewes
 del 7 al 11 de febrero de 2022
 Hora UTC: 02:00

03/02: Sistemas de coordenadas y sistemas de referencia
 04/02: Sistema de referencia geodésico, reducción y marcos
 05/02: Sistema y marco de referencia terrestres
 10/02: Marcos de referencia regional y transformación de deformaciones
 11/02: Aplicación de los marcos de referencia en la práctica

SIRGAS IAG TUM

TALLER: SISTEMAS DE ALTURAS Y GRAVEDAD
 02 al 06 de Mayo de 2022 - 2:00 pm (UTC 0)

02/5	Laura Sánchez Tecnólogo Geodésico München - TUM Alemania	Sistema Internacional de alturas de Referencia (IHRF), realización (IHRF), estado actual
03/5	Gabriel de N. Cuitián Universidad Federal de Rio de Janeiro - UFRRJ Brasil	Estado del IHRF en la región SIRGAS
04/5	Dimitar Dimitov Geodeta Nacional de Bulgaria - Geodetski Institut Nacional de Bulgaria Ana Cristina C. de Matos Geodeta Nacional de Portugal - Instituto Geográfico Nacional - IGN Portugal	Gravimetría y Geodesia en la región SIRGAS
05/5	Ezequiel D. Antikolietz Instituto Geográfico Nacional de España - Instituto Geográfico Nacional - IGN España	Definición del Sistema de Referencia Internacional de Gravedad (IGSF) y su materialización
06/5	Roberto F. Luz Geodeta Nacional de Chile - Instituto Geográfico Nacional - IGN Chile	Integración, marcos geopotenciales y la utilización y propagación del IHRF

El taller será dictado en idioma español, y transmitido simultáneamente por el canal de Youtube de SIRGAS.

WORKSHOP: Installation and Operation of permanent GNSS stations. How to include them in the SIRGAS-CON Network?

26/08	Alexander Jovanović Geodeta Nacional de Serbia - Geodetski Institut Nacional de Serbia - GIN Serbia	Steps and details on the installation of a permanent GNSS station
29/08	Sergio Costa Geodeta Nacional de Chile - Instituto Geográfico Nacional - IGN Chile	Basic steps about receivers configuration
30/08	Alexander Jovanović Geodeta Nacional de Serbia - Geodetski Institut Nacional de Serbia - GIN Serbia Dimitar Dimitov Geodeta Nacional de Bulgaria - Geodetski Institut Nacional de Bulgaria - GIN Bulgaria	Evaluation of data and metadata from GNSS stations Procedure for the inclusion of stations in the SIRGAS-CON Network
31/08	Laura Sánchez Tecnólogo Geodésico München - TUM Alemania	Inclusion of SIRGAS-CON stations in the IGS (geodetic and reference network)

at 20:00 pm (UTC 0), for one hour every day.

SIRGAS UNAVCO IBGE TUM

The Workshop will also be broadcast simultaneously on the SIRGAS Youtube channel and channel and will be available simultaneously translation ENG, ESP, ESP-ENG.

Back to face-to-face...



- Determination of precise geodetic reference frames using the scientific software for GNSS processing GAMIT-GLOBK, Costa Rica, July 2022

Today's scenario in the Americas and Caribbean

Technology pushes Geodesy towards "Global Sense!"

Heterogeneous knowledge, experience, resources and infrastructure

We need to build on...

- ✓ Policies, Standards and Conventions (laws, normative acts)
- ✓ Capacity building and training under a strong cooperation&collaboration between countries and SIRGAS;
- ✓ Clear and simple communication/outreach about geodesy and the importance of geospatial information interoperability and geodetic infrastructure;
- ✓ Better geodetic infrastructures: Geodetic Observatories, National CORS Networks;
- ✓ Geodetic Data Sharing for reliable models, products and services.

Acknowledgements

- SIRGAS activities are possible thanks to the active support of colleagues contributing to the working groups, to capacity building activities, operating GNSS stations, operating SIRGAS Analysis Centres;
- The support provided by the International Association of Geodesy (IAG) and the Pan-American Institute for Geography and History (PAIGH) to the geodetic reference activities in the SIRGAS region are highly appreciated by SIRGAS membership;
- To the institutions that work in collaboration with the SIRGAS training, in person and remotely.

More Information at:

<https://sirgas.ipgh.org/>

Social Media : *@SirgasAmericas*

