



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

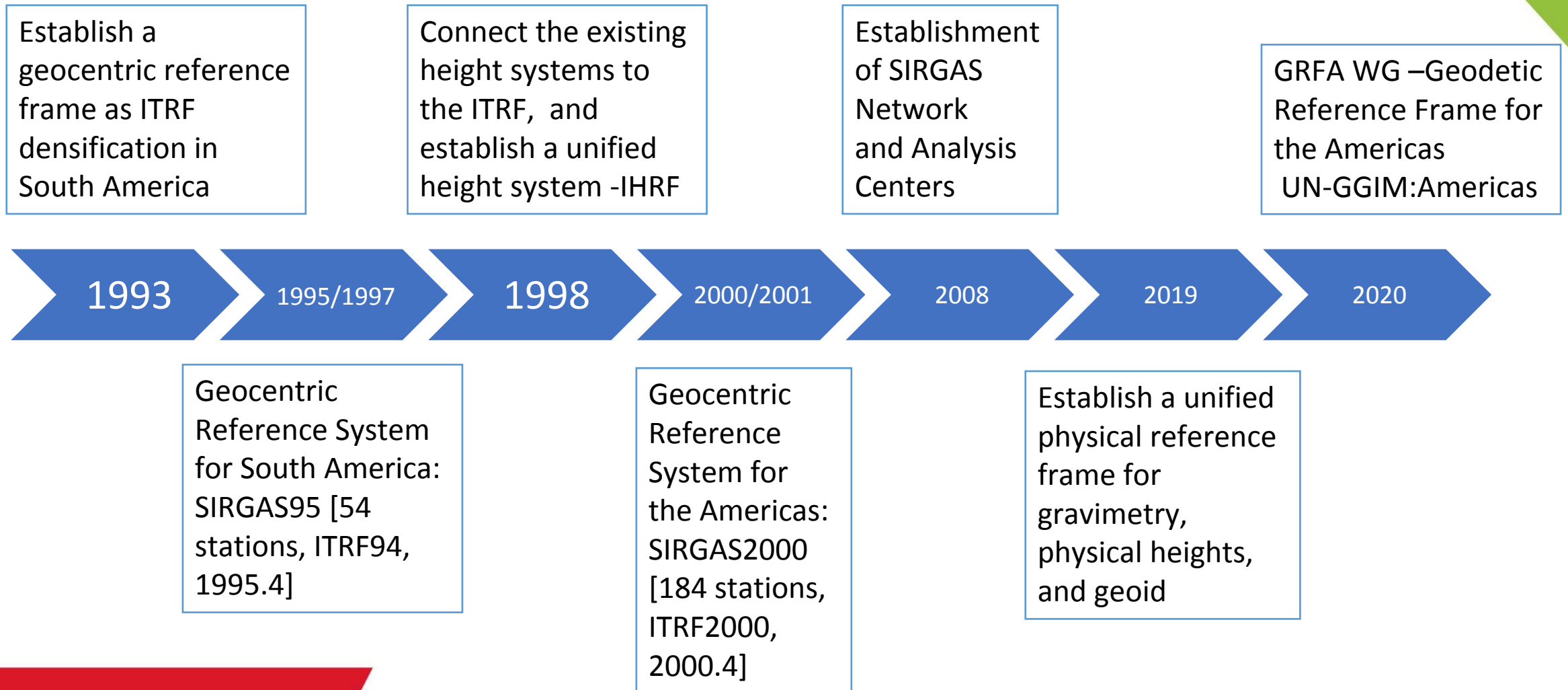
Session 5



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.

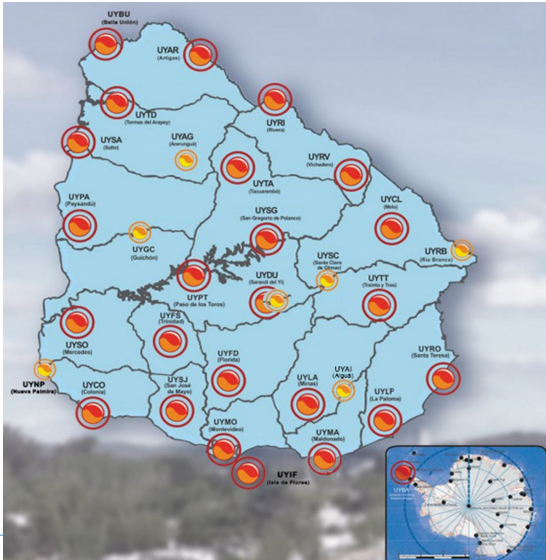
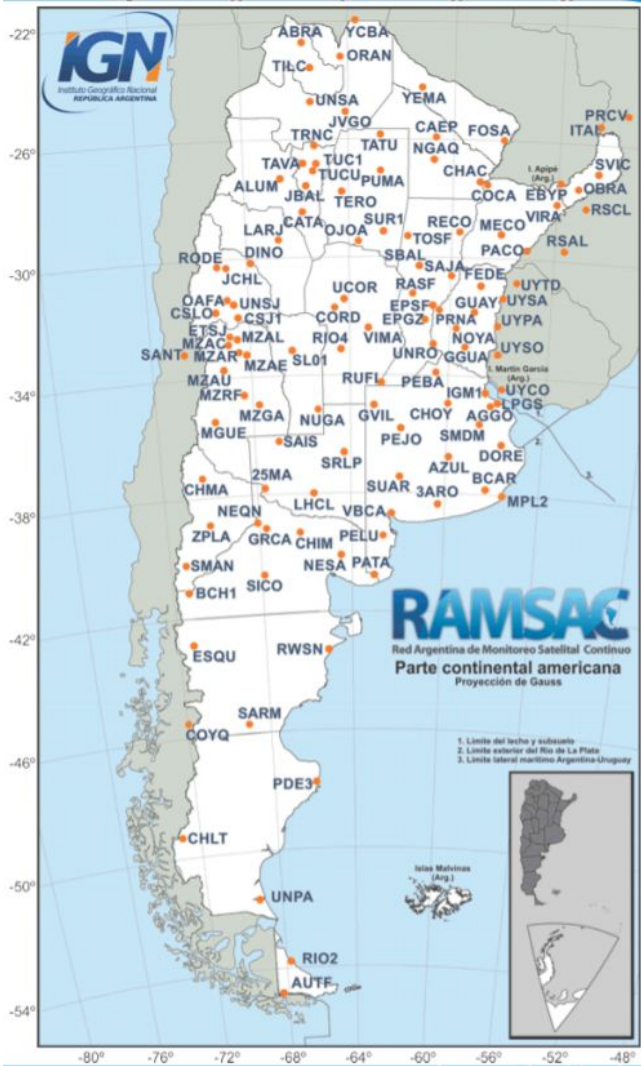
Geodetic Infrastructure

GNSS CORS Networks

GNSS Data Centers

GNSS Analysis Centers

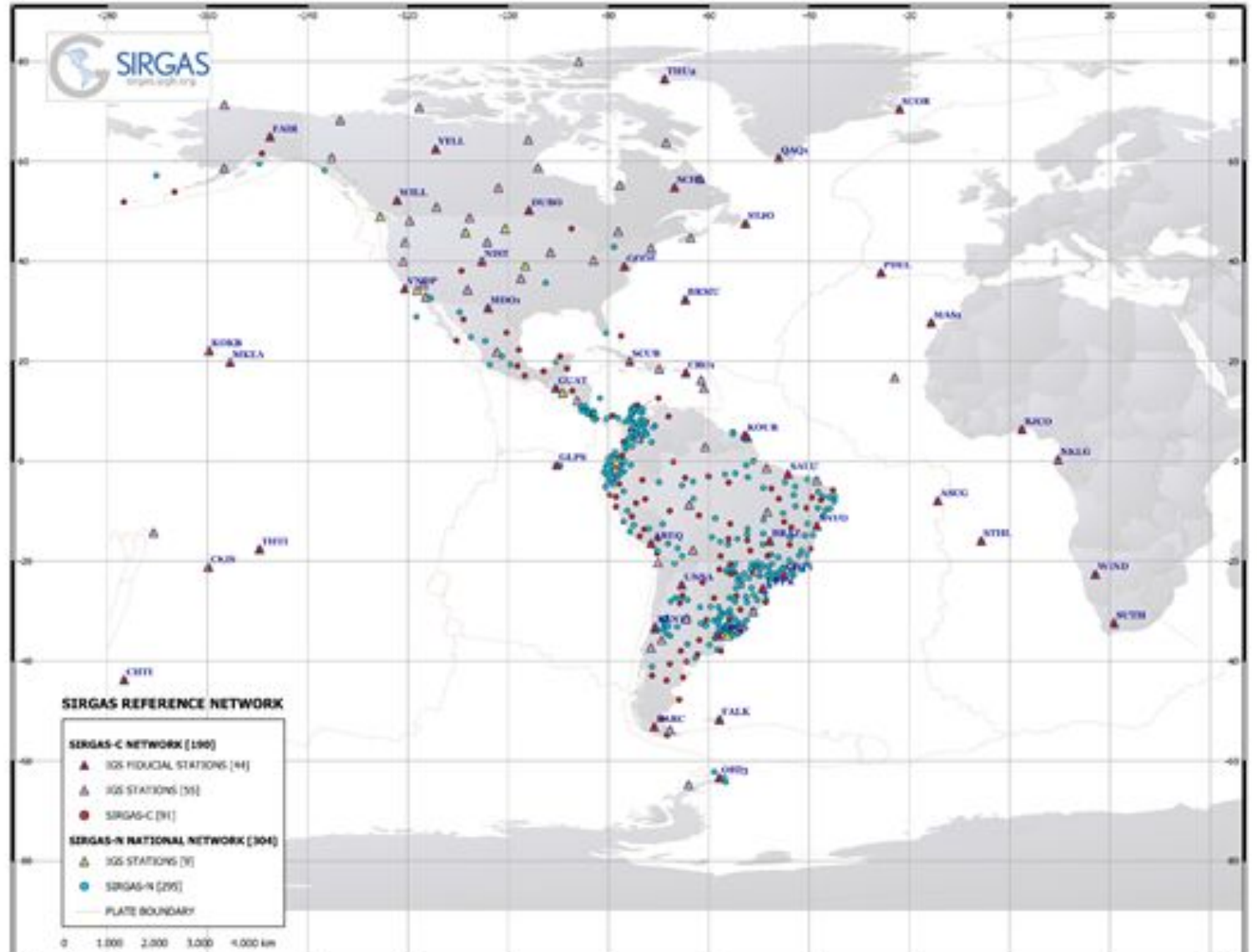
Argentina	RAMSAC
Bolivia	MARGEN
Brasil	RBMC
Chile	IGS, CSN, CAPES
Colombia	MAGNA-ECO
Costa Rica	RGNA-CR
Ecuador	REGME
México	RGNA
Panamá	Panama-CORS
Perú	REGPMOC
Uruguay	REGNA-ROU



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

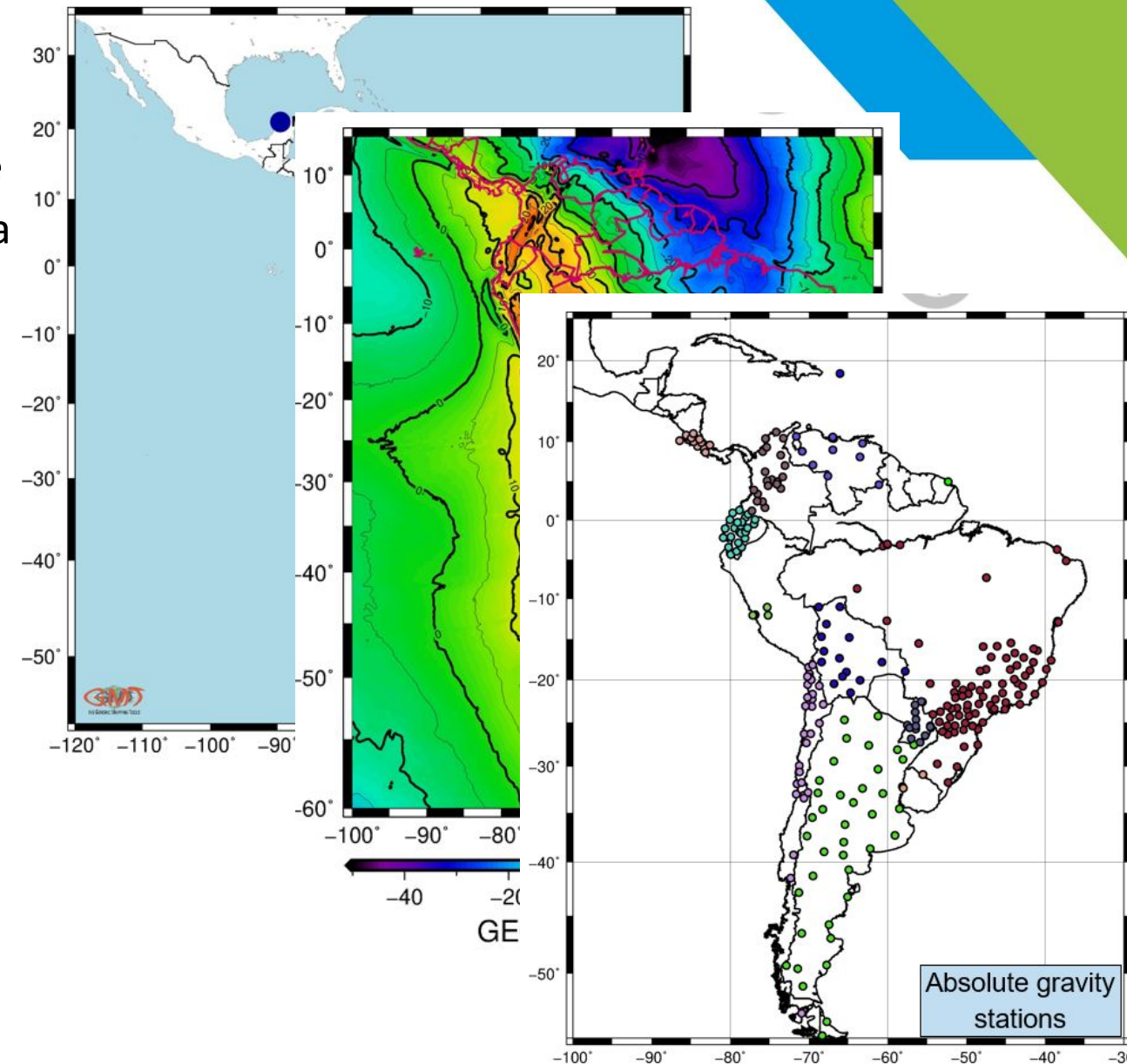
- GNSS data from 493 Stations
- Analysis
 - Ten GNSS analysis centres
 - Two GNSS combination centres
 - One analysis centre for the Neutral Atmosphere
- Products
 - Combined tropospheric Zenith Path Delays (hourly sampling rate)
 - Weekly station positions aligned to the IGS reference frame – IGB14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



Geodetic Infrastructure : Physical heights and Geoid modelling

- **Objectives:**

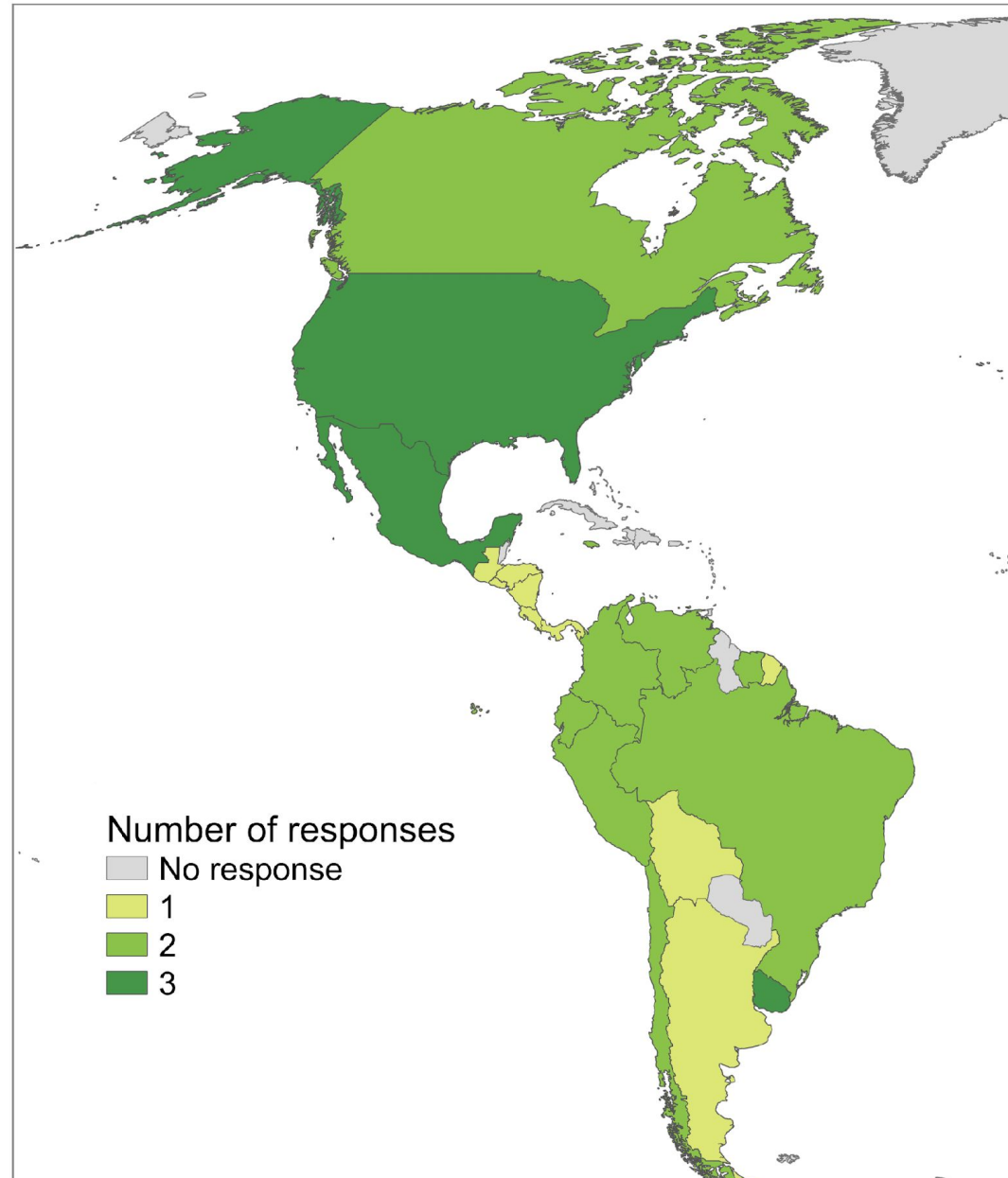
- To provide a reference standard for the precise determination of physical heights establishing a regional densification of *International Height Reference Frame – IHRF*;
- To provide precise regional/national geoid models to support GNSS/levelling applications with high reliability
- To provide a reference 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.gob.ar/ppp/auth/login>

- ✓ IBGE-PPP (Brasil)

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

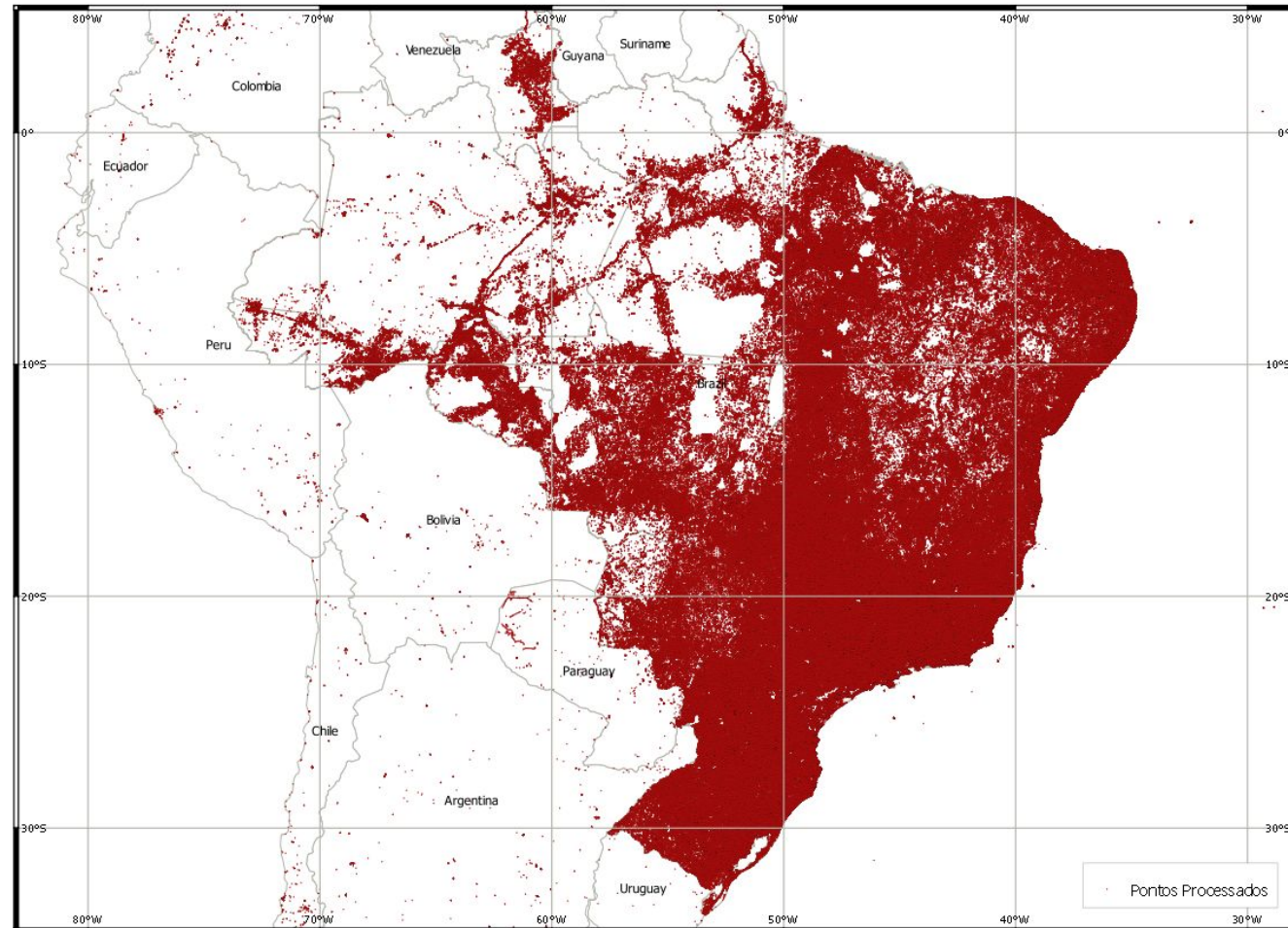
- ✓ OPUS (Estados Unidos)

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

- ✓ CSRS-PPP (Canadá)

<https://webapp.geod.nrcan.gc.ca/geod/tools-outils/ppp.php>

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



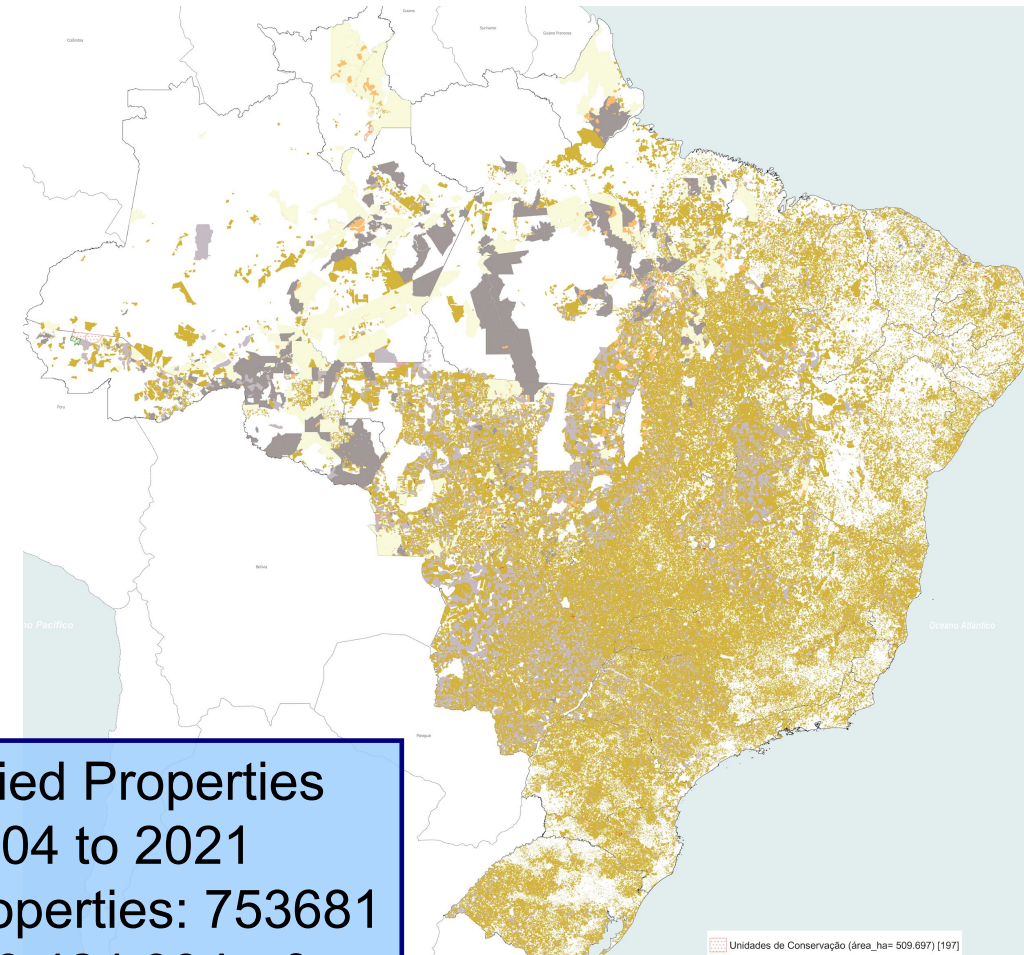
Geospatial information interoperability for the societal benefits

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(screetch) 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

07/02 Sistemas de coordenadas y sistemas de referencia
08/02 Sistema de referencia celeste, rotación y marcos
09/02 Sistema y marco de referencia terrestre
10/02 Marcos de referencia regional y modelación de deformaciones
11/02 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 Technische Universität München - TUM/Alemania	Sistema internacional de alturas: definición (IHRF), realización (IHRF), estado actual
03/5	Gabriel do N. Guimarães Universidade Federal de Uberlândia - UFU/Brasil	Estado del IHRF en la región SIRGAS
04/5	Denizar Blitzkow Centro de Estudios de Geodesia - CENIG/Brasil Ana Cristina O. C. de Matos Comissão Nacional de Geodésia - CONIG/Brasil	Gravimetría y Geoida en la región SIRGAS
05/5	Ezequiel D. Antokietz Universidad Nacional de La Plata - UNLP/Argentina Comisión Nacional de Investigación Geodésica y Geográfica - CONIG/Argentina	Definición del Sistema de Referencia Internacional de Gravedad (IGRS) y su materialización
06/5	Roberto T. Luz Instituto Brasileiro de Geografia e Estatística - IBGE/Brasil	Nivelación, números geopotenciales y la evaluación 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	Anne Ziers IGGZ/Chile	Steps and details on the installation of a permanent GNSS station
29/08	Sorlio Costa IGGZ/Brasil	Basic steps about receivers configuration
30/08	José Antonio Torro Universidad Tecnológica de Chile - UTECH/Chile Jesús María Inzunza Instituto Geográfico Nacional - IGN/Chile	Evaluation of data and metadata from GNSS stations Procedure for the inclusion of stations in the SIRGAS-CON Network
31/08	Laura Sánchez Technische Universität München - TUM/Alemania	Inclusion of SIRGAS-CON stations in the IGS (products and reference network)

at 2:00 pm (UTC 0), for one hour every day

SIRGAS IAG TUM UNAVCO IBGE

The Workshop will also be broadcast simultaneously on the SIRGAS YouTube channel and channel and will be available simultaneous 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*

