



# SIRGAS and GRFA WG UN-GGIM:Americas

Sonia Costa, Diego Pinon, Jose Antonio Tarrio Mosquera, Demian Gomez, Gabriel Guimaraes

UN-GGIM-AP WG1 Session  
November 2, 2021

## American Continent

*36 countries*

*Diverse resources and knowledge*

## Geodetic Agencies

*Several types of Administration*

*GEO+STA, Military, Cadastre*

Different data Policy

## Geodetic Infrastrucure

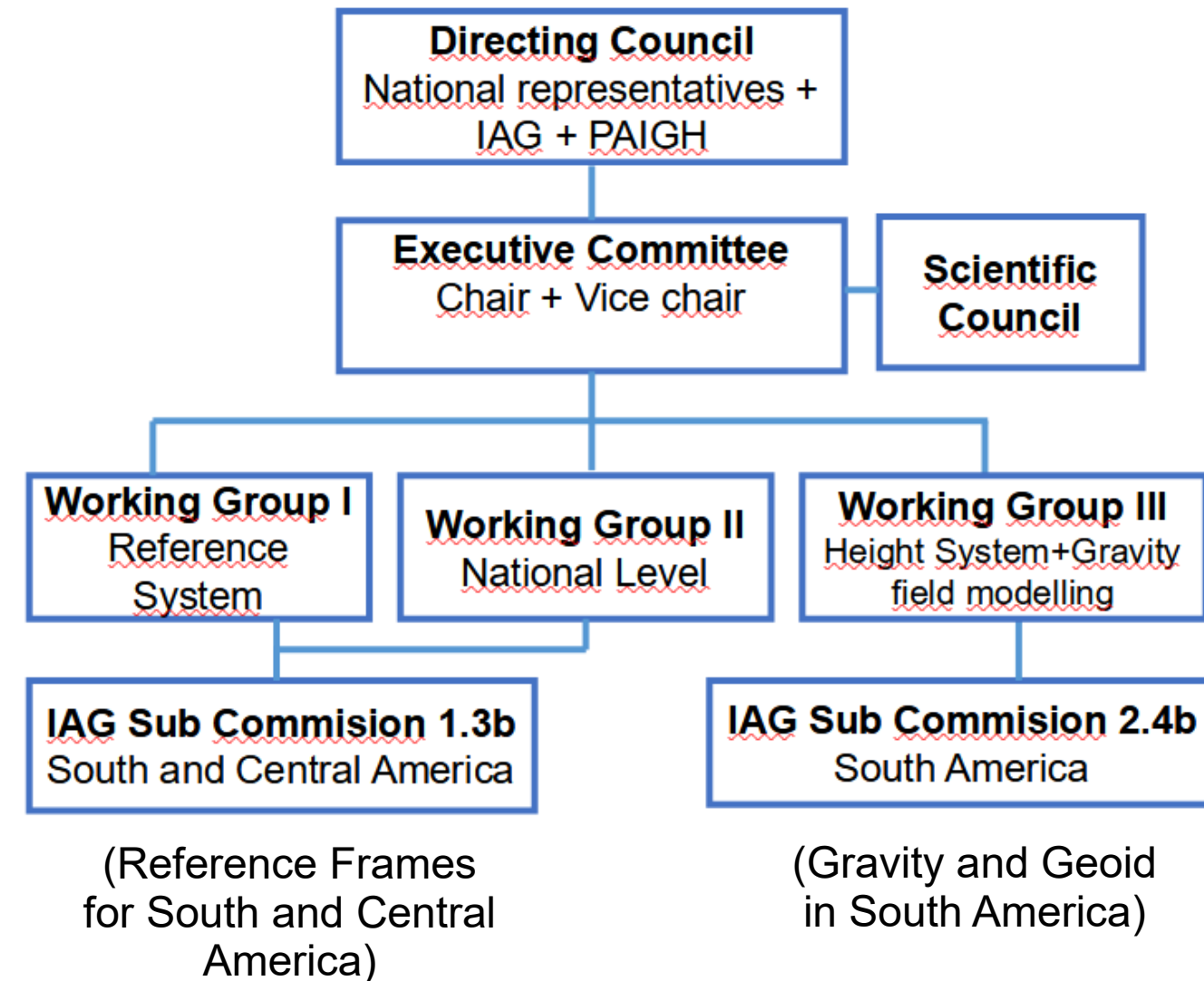
GLOBAL	-
Reference Frame – CORS Network	Passive Networks
Geoid Model	-
Dymanic Datum	<b>Static Datum</b>
Coordinates, Velocities Data, Model, Products and Services	<b>Coordinates</b>

✓ The Geodetic Reference System for the Americas (SIRGAS) is a 28 year-old voluntary country collaborative project focused on obtaining regional geodetic infrastructure based on the International Association of Geodesy (IAG) standards, recommendations, products, and services.

✓ **Main objectives:**

- Establish and maintain a continental geocentric reference frame (a network of stations with geocentric coordinates  $[X, Y, Z]$  of high precision and their variation over time  $[V_x, V_y, V_z]$ );
- Define and maintain a unified vertical reference system by means of physical and geometric heights that are consistent at the global level;
- Develop and update a gravimetric geoid model for continental coverage;
- Establish and maintain a continental absolute gravity network;

## Operational structure of SIRGAS





- ✓ 22 Member States from South, Central, North America and Caribbean region;
- ✓ Adopted SIRGAS or ITRF realizations;
- ✓ Promote, among the Member States, homogeneity in the scientific and technical knowledge, bringing professionals up to date and training human resources;

**SIRGAS Workshops: 14 (436 students - 10 countries on average)**

**SIRGAS Schools: 7 Total ( 603 students - 17 countries on average)**



***The International Workshop for the Implementation of the Global Geodetic Reference Frame in Latin America , IGN, Buenos Aires, Argentina, from Sep 16 to 20, 2019***  
*130 participants from 20 countries*

***SLR Workshop, 2019 SIRGAS Symposia ,***  
*IBGE, Rio de Janeiro, Brasil, 6 to 8 November, 2019*



*25 attendees from 9 countries*  
*6 from latinamerican SLR observatories*



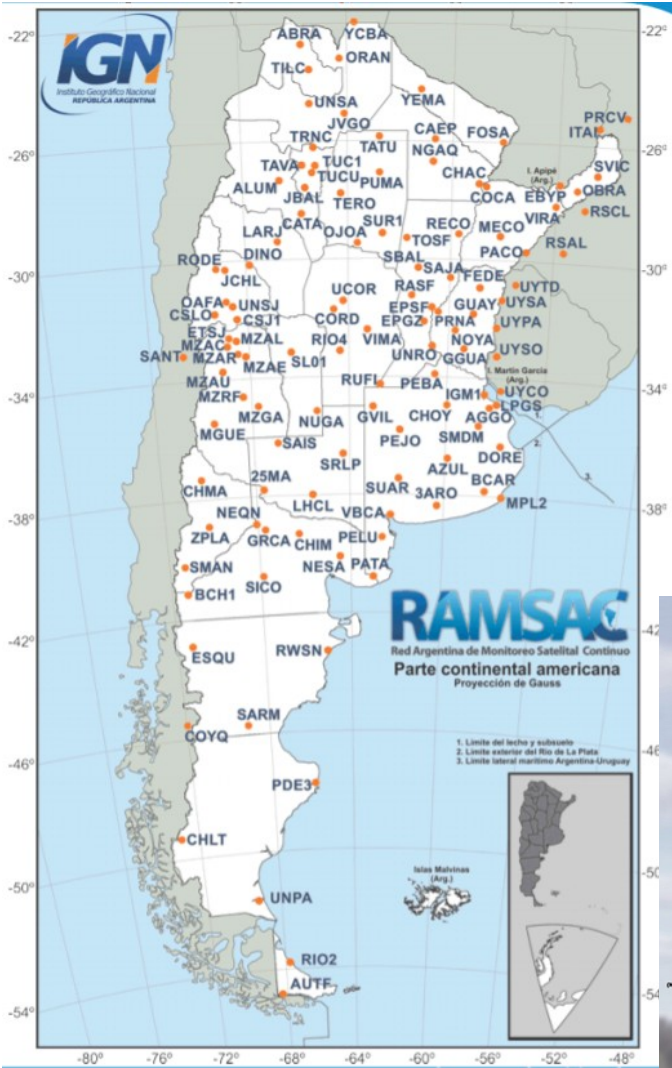
# SIRGAS Reference - SIRGAS WG I : Reference System (IAG SC 1.3b )

Densify ITRF in the American Continent and Caribbean region

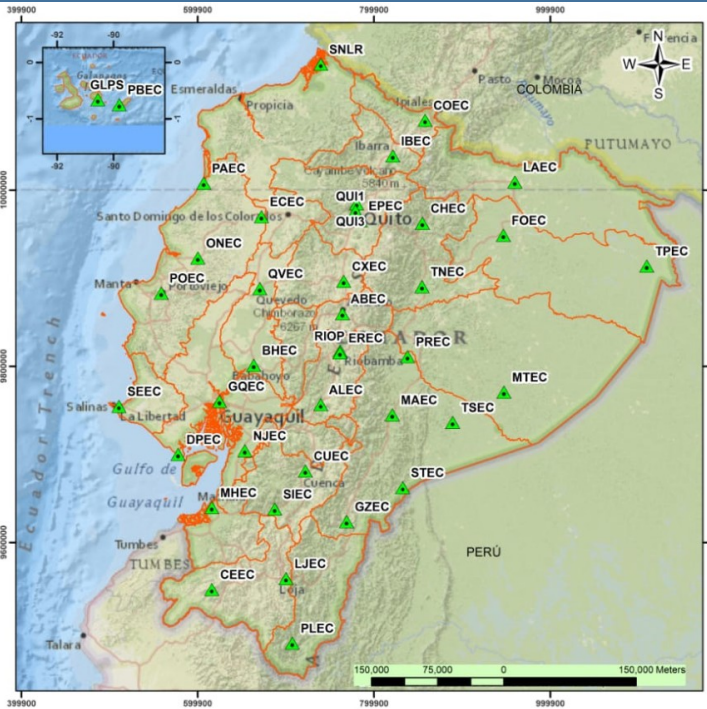


Geodetic Infrastructure  
GNSS CORS Networks  
GNSS Data Centers  
GNSS Analysis Centers

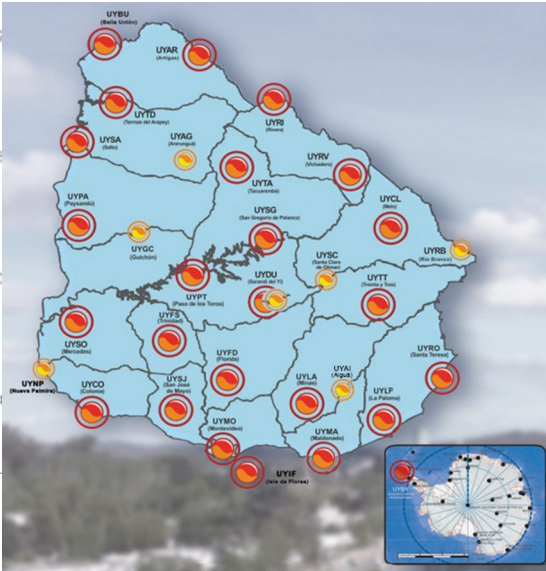
Argentina	RAMSAC
Bolivia	MARGEN
Brasil	RBMC
Canadá	CACS
Chile	IGS, CSN, CAPES
Colombia	MAGNA-ECO
Costa Rica	RGNA-CR
Ecuador	REGME
Estados Unidos	NGS-CORS
México	RGNA
Panamá	Panama-CORS
Perú	REGPMOC
Uruguay	REGNA-ROU



Argentina



Ecuador



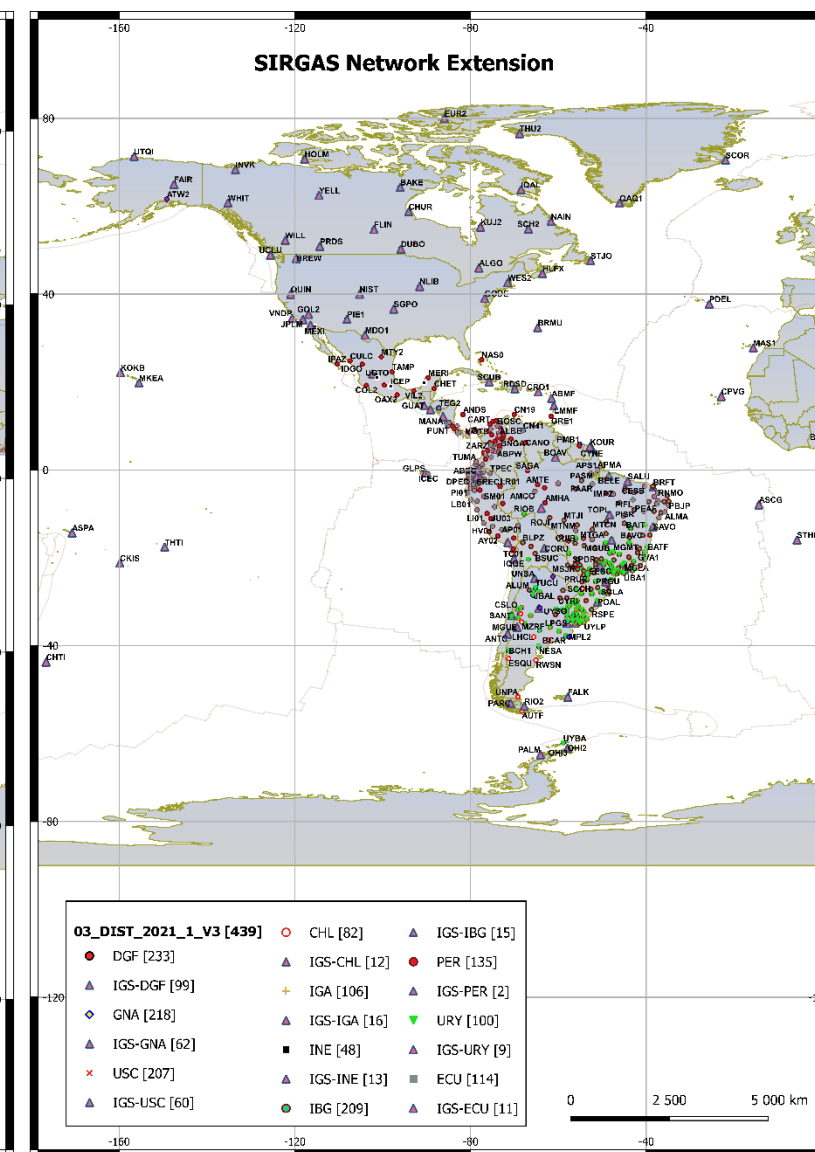
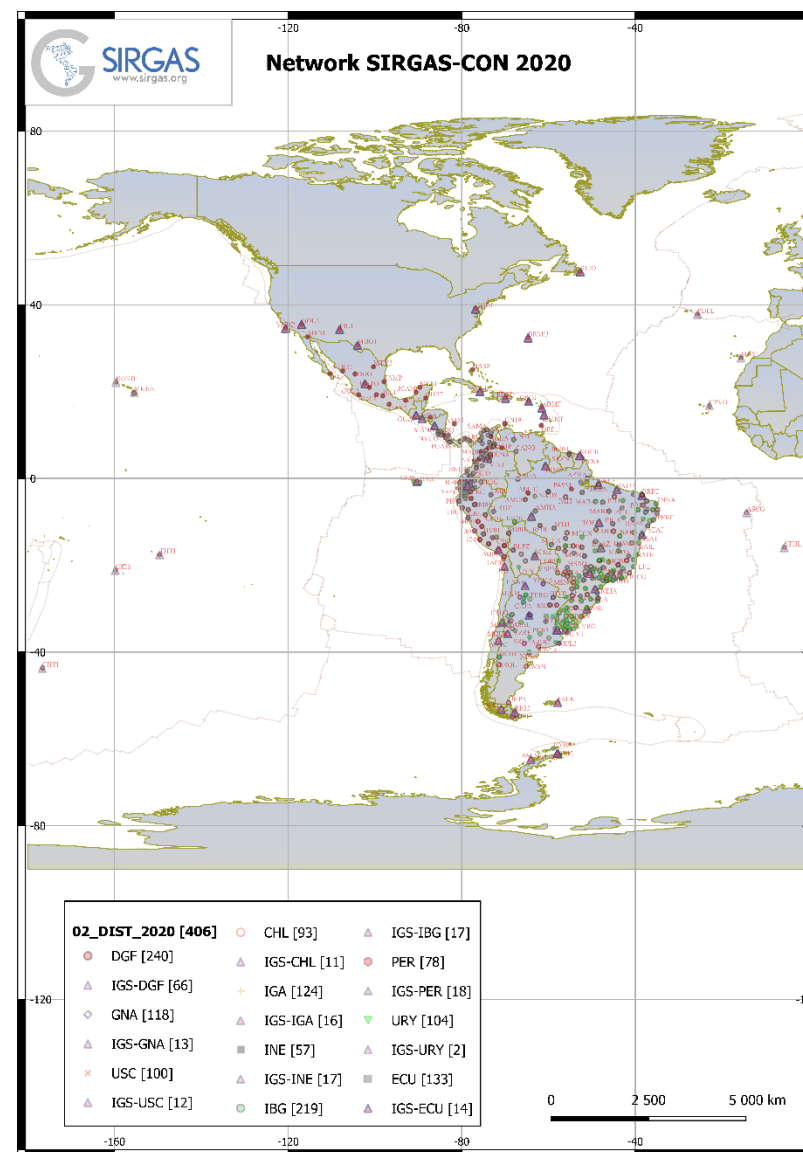
Uruguay

# Geodetic Infrastructure

## SIRGAS Reference Network Expansion

### ~ 440 continuous operating GNSS Network

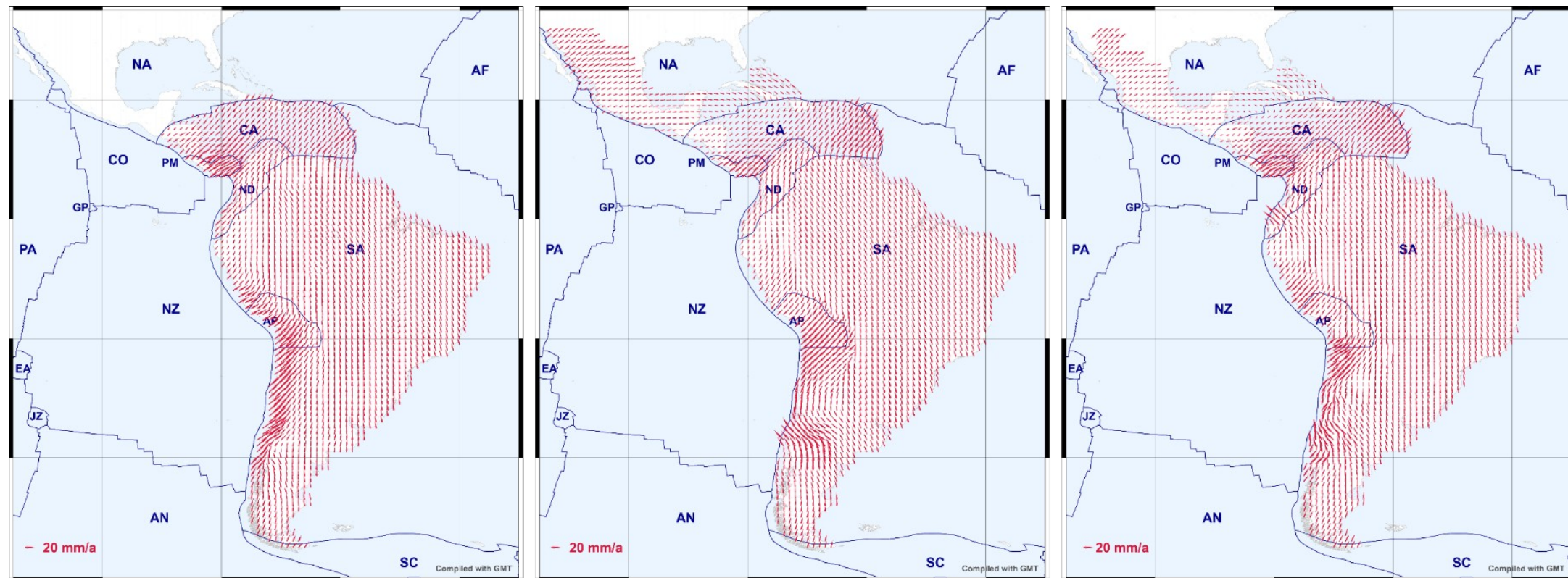
- ✓ To maintain and ensure the long-term stability of the SIRGAS reference frame;
- ✓ accessibility to the global reference system at regional, and national;
- ✓ **Products:** weekly station positions, multi-year solutions, surface deformation models, and tropospheric parameters in hourly intervals.





## SIRGAS Velocity Models

Modelo	Realizaciones	Región	Estaciones	Validez
VEMOS2009	SIR09P01	56°S to 20°N	96 stations (400 additional velocities)	January 2, 2000 to june 30, 2009
VEMOS2015	SIR15P01	55°S, 110°W to 32°N, 35°W	456 stations	March 14, 2010 to abril 11 2015
VEMOS2017	SIR17P01	55°S, 120°W to 32°N, 35°W	515 stations	January 1, 2014 to January 28, 2017



VEMOS2009 ( Drewes H., Heidbach O., 2012)

VEMOS2015 (Sánchez L., Drewes H., 2016)

VEMOS2017 (Drewes H., Sánchez L., 2017)

## Multi-year solutions

### SIRGAS reference frame realization

DGFI-TUM, IGS RNAAC SIRGAS

#### SIR17P01

Aligned to IGS14, epoch 2015.0

Time span: 2011 - 2017

345 stations

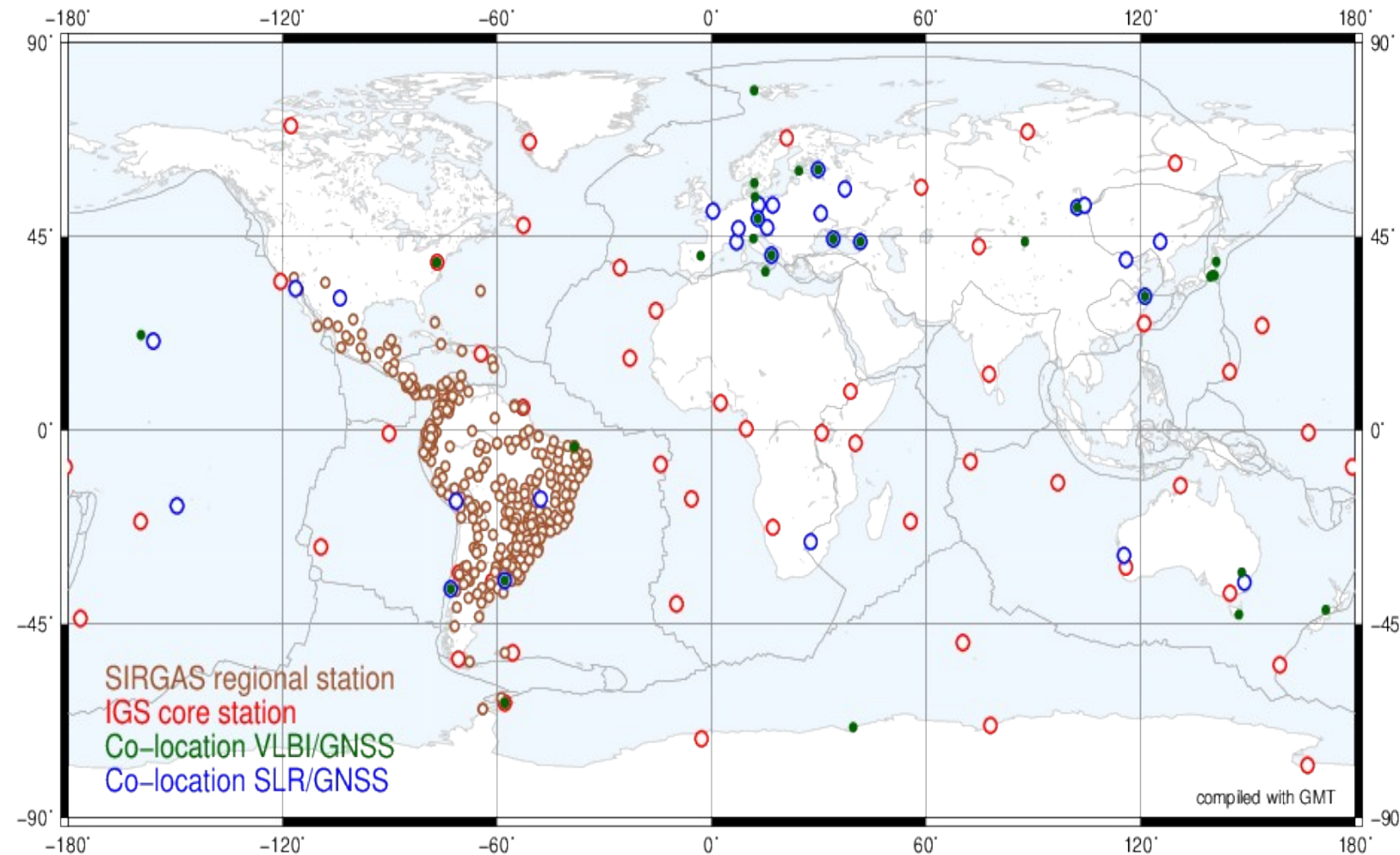
#### SIR2020

Aligned to IGS14/IGb14, epoch 2010.0

Time span: 2000 - 2020

723 stations

Included global IGS stations co-located with VLBI and SLR





Technology pushes Geodesy towards "Global Sense!"  
Heterogeneous knowledge, experience, resources and infrastructure

## We need to build on...

- ✓ 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 – ITRF-WGS84;
- ✓ Better geodetic infrastructures: Geodetic Observatories, National CORS Networks;
- ✓ Geodetic Data Sharing for reliable models, products and services,
- ✓ Participate through IGS station, etc...

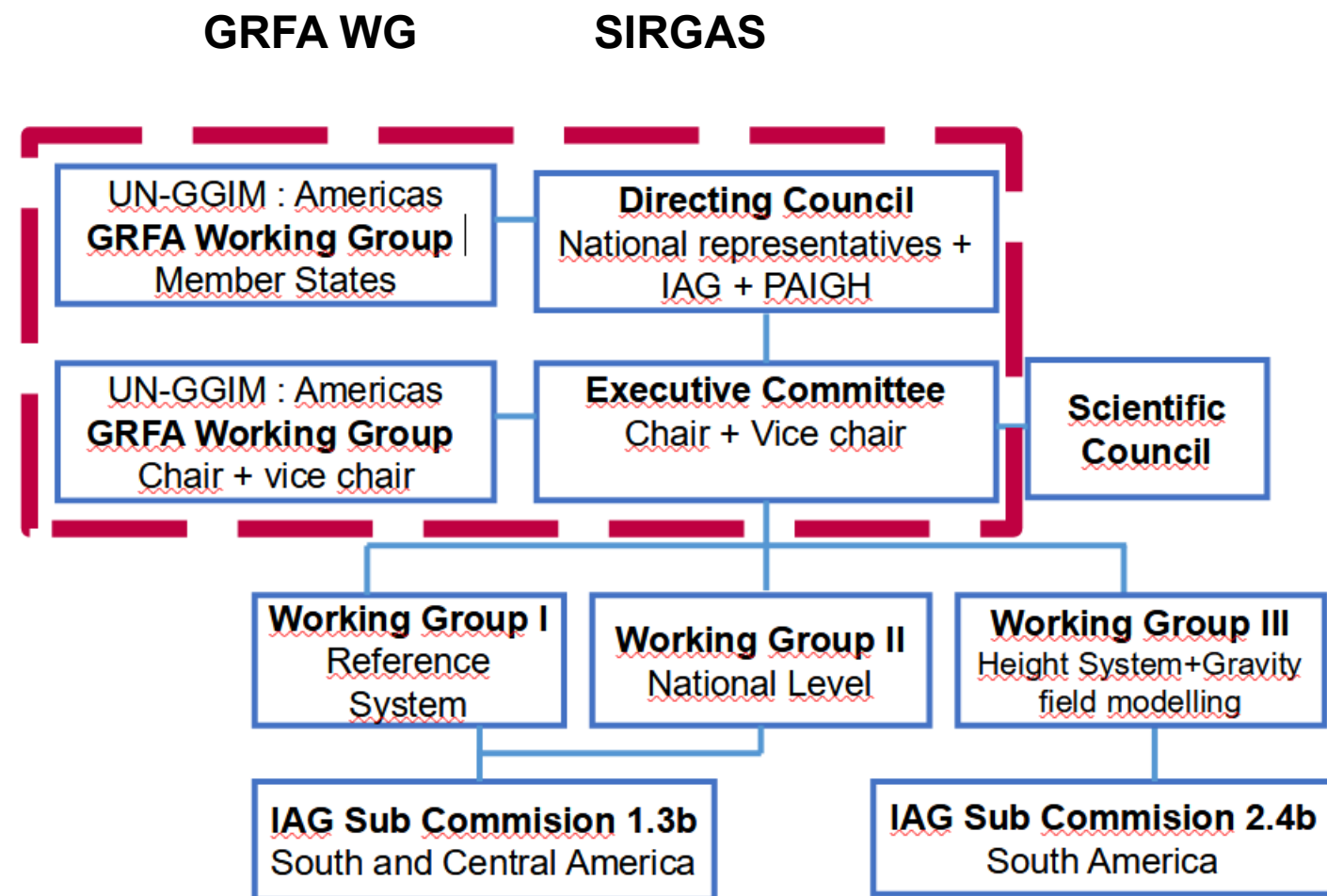
**Respond and Implement the UN GGRF Resolution for Sustainable Development**

# Geodetic Reference Frame for the Americas (GRFA)

## Working Group UN-GGIM:Americas

### Motivation of the GRFA WG

- ✓ Interface with the United Nations SubCommittee on Geodesy (UN-SCoG);
- ✓ Coordinate and assist the efforts of SIRGAS and member countries in the implementation of the GGRF in the Americas;
- ✓ National representation of the Geodetic agencies in the region, the same as in SIRGAS Directing Council as a better coordination between these groups;
- ✓ cooperation and exchange of dialogue on issues relating to the maintenance, sustainability and enhancement of, and access to, the Global Geodetic Reference Frame (GGRF);





The future steps in order to advocate for and implement the Global Geodetic Reference Frame (GGRF) in the Americas for sustainable development.





**¡Gracias!**  
***Thank you!***

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

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