



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

9° SESSION

UN-GGIM: Americas

The Implementation of GGRF in the Americas

Global Geodetic Reference Frame for the Americas

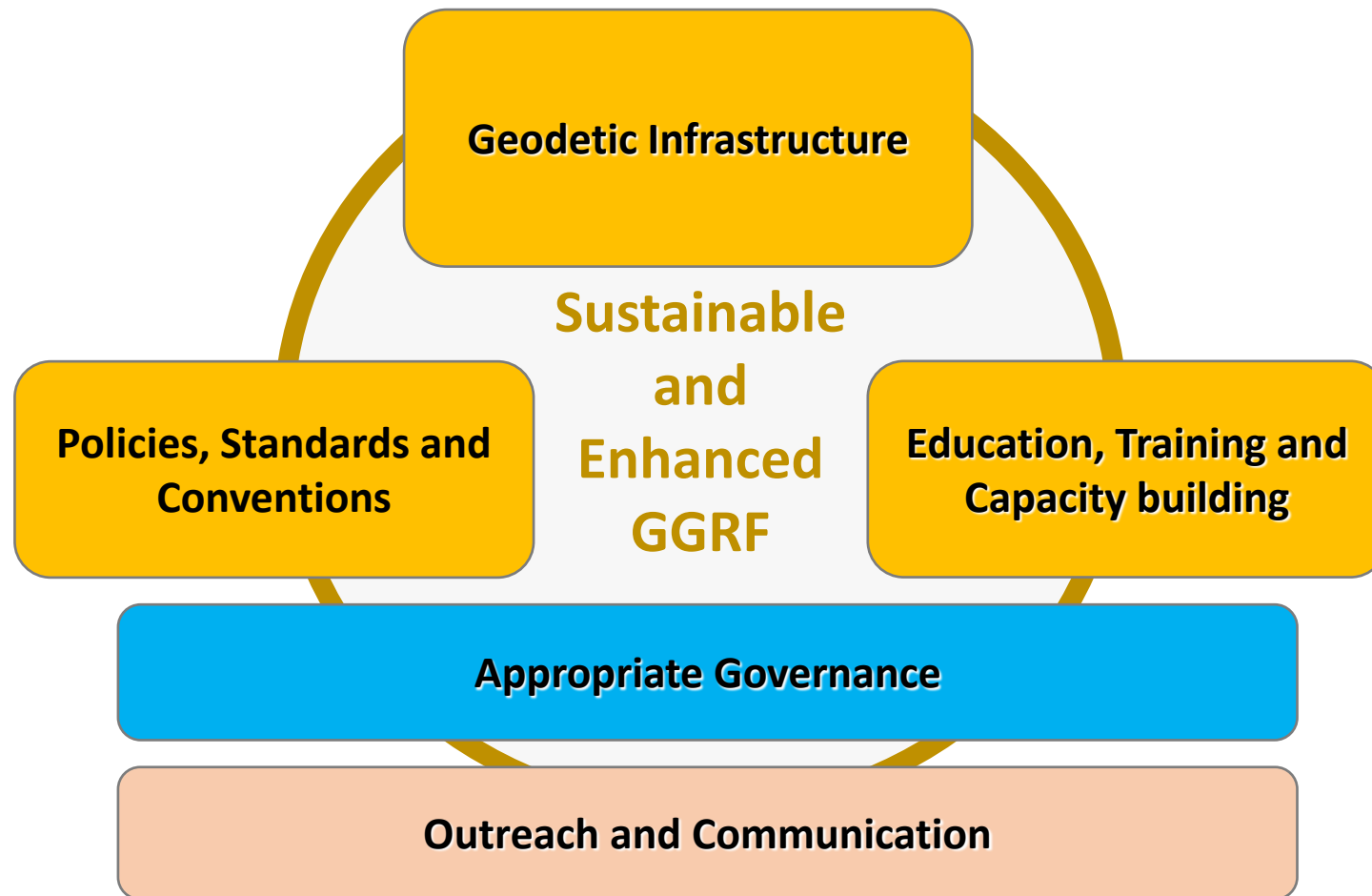
WG GRFA

Sonia Costa

Session 9

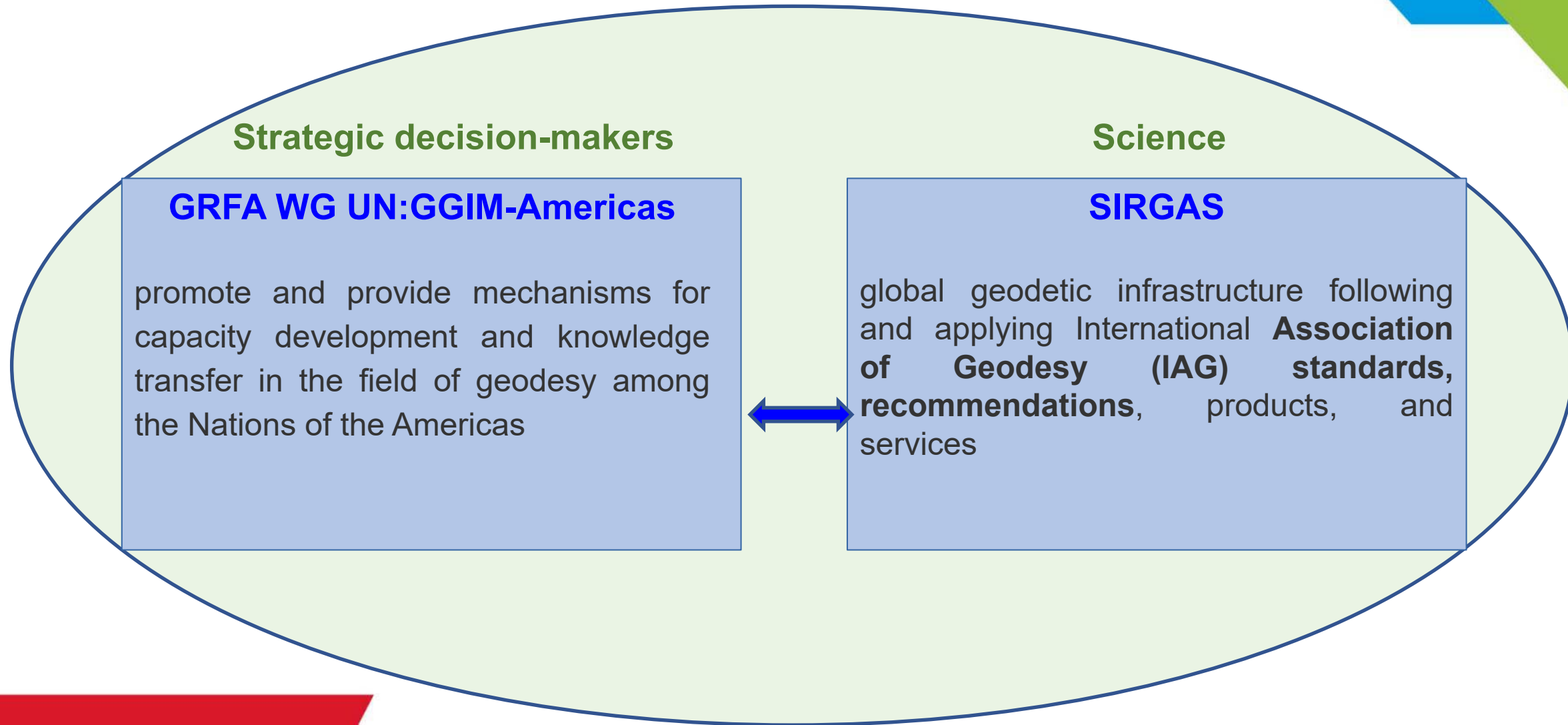
November 28, 29 and 30
Santiago de Chile, ECLAC

“Road Map for the Global Geodetic Reference Frame
for Sustainable Development Implementation Plan”
UN-GGIM Eighth Session, New York, 1-3 August 2018





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



How each contribution can help to Understand&Predict the Earth System

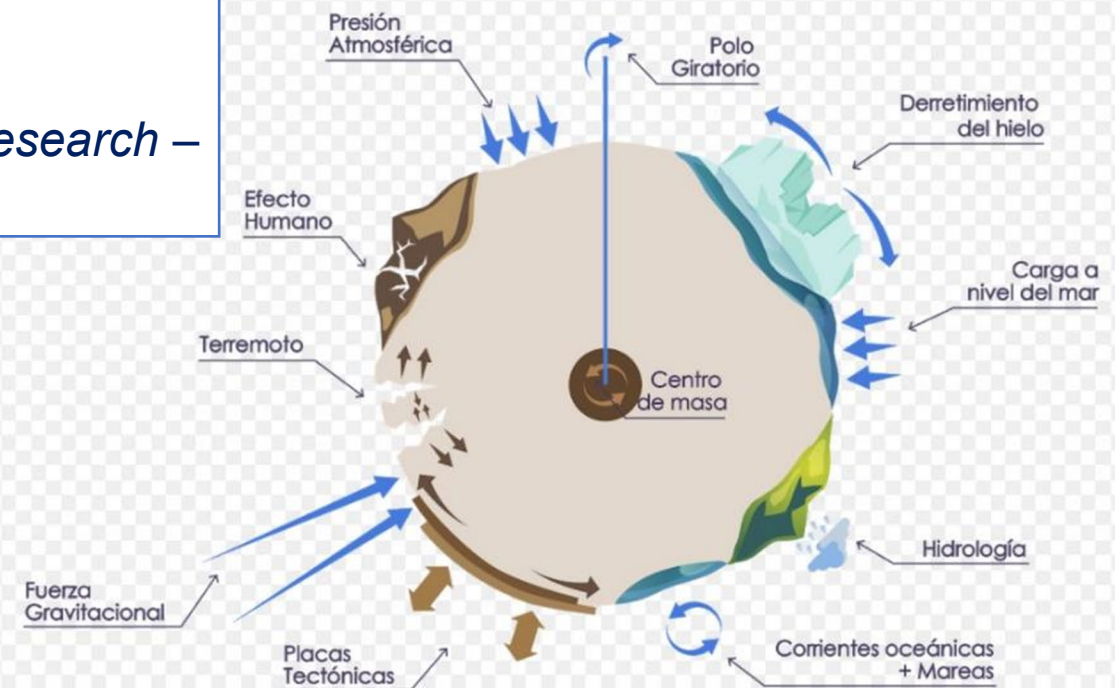


What do we need?

Open Data Sharing

Data interoperability – Formats, standards

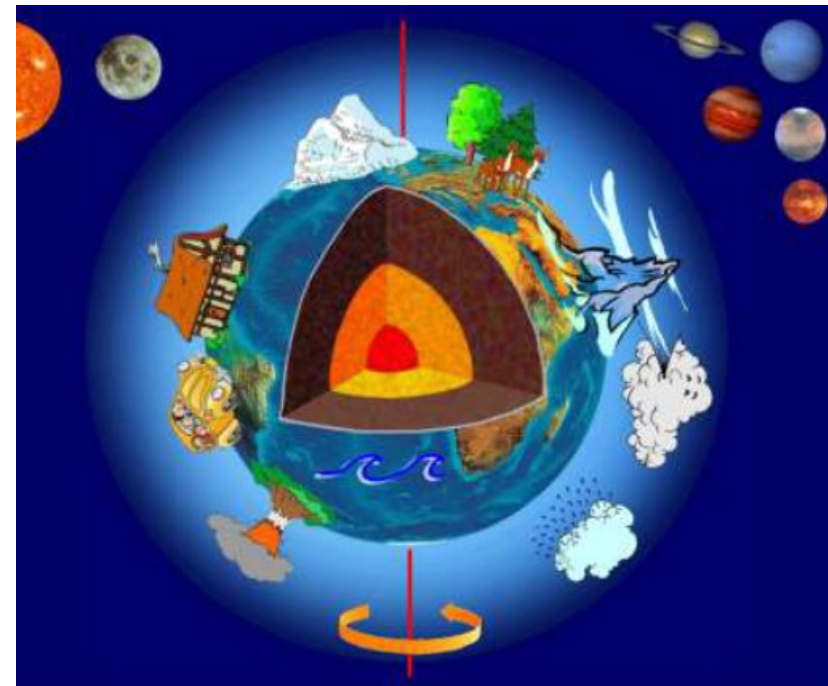
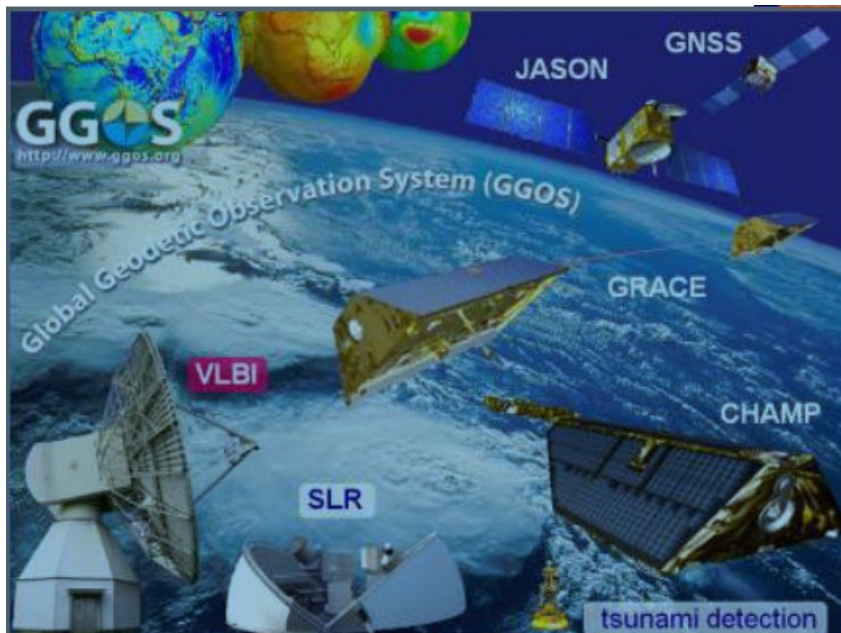
*Geospatial information interoperability:
for the societal benefits (industries, agriculture, services)
For the monitoring the Earth system and global change research –
climate change and natural disasters prevention*



Global Geodetic Observing System of the IAG

For the monitoring the Earth system and global change research

The combination and integration of all available observations like physical measurements and geometric techniques can improve our understanding of the interactions in "System Earth"



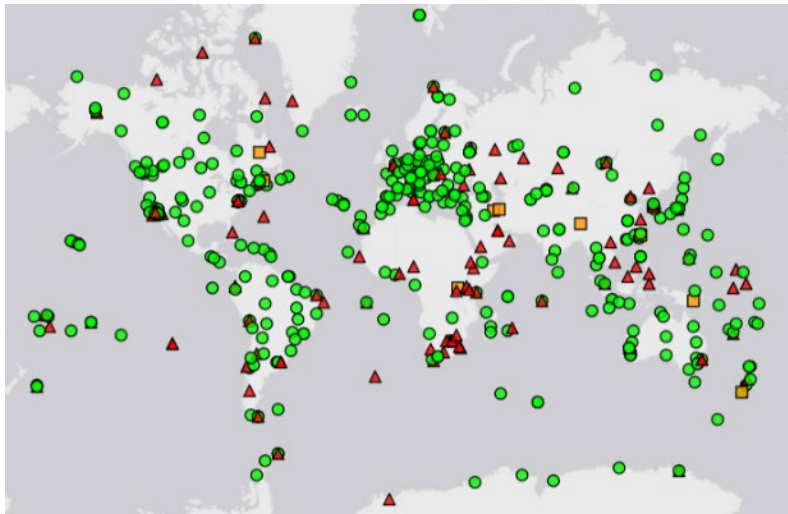
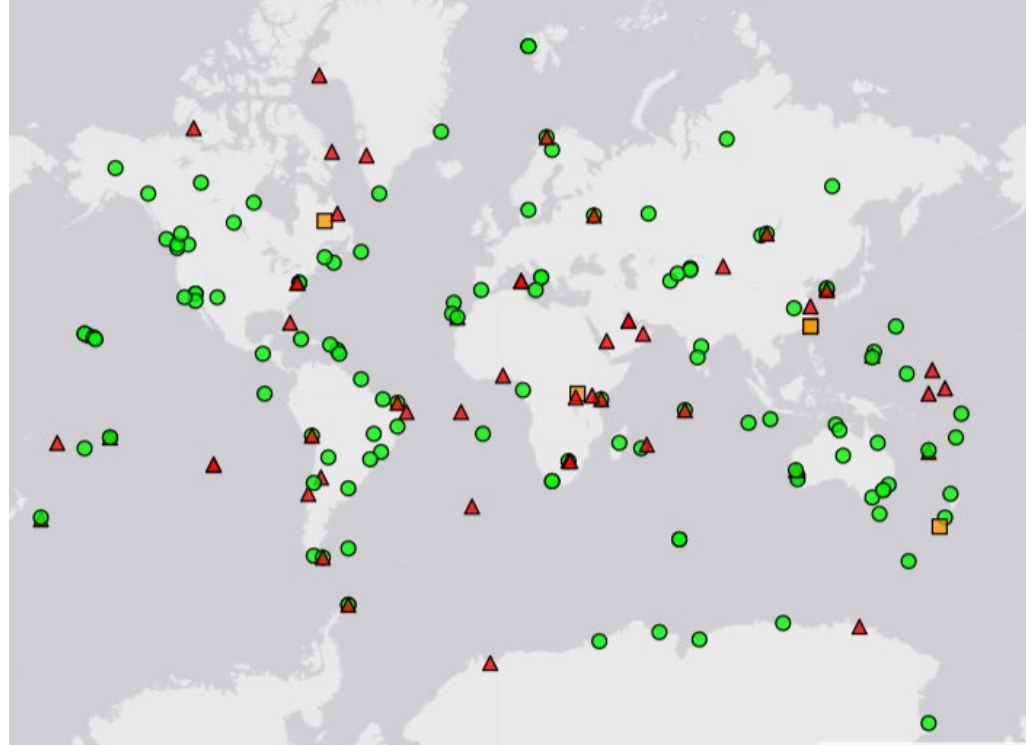
IAG Services: Geometry, Gravimetry, Ocean, Standards

International GNSS Service – 2021/9 Resolution

Red IGS / *IGS Network*

<https://igs.org/network/#propose-new-site>

IGS Core



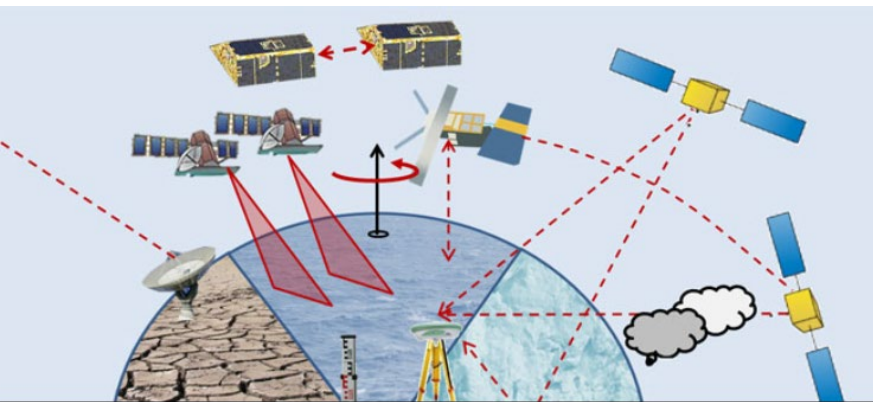
Improve IGS Products:

- Orbits and EOP
- Satellite and station clock solution (5 minute y 30 second)
- Coordinates and Velocities
- Ionosphere vertical total electron content (TEC) maps and
- Troposphere(zenith path delay (ZPD)
- GNSS satellite differential code bias (DCB)

International GNSS Service – 2021/9 Resolution

The IGS collects, archives, and distributes high-quality GNSS data to meet the objectives of a large number of scientific (Earth observations and research) and practical (position, navigation, and weather) applications for the benefit of science and society.

GNSS data are essential for processes monitoring that occur on our planet, contributing to a better understanding of climate change and disaster prevention.



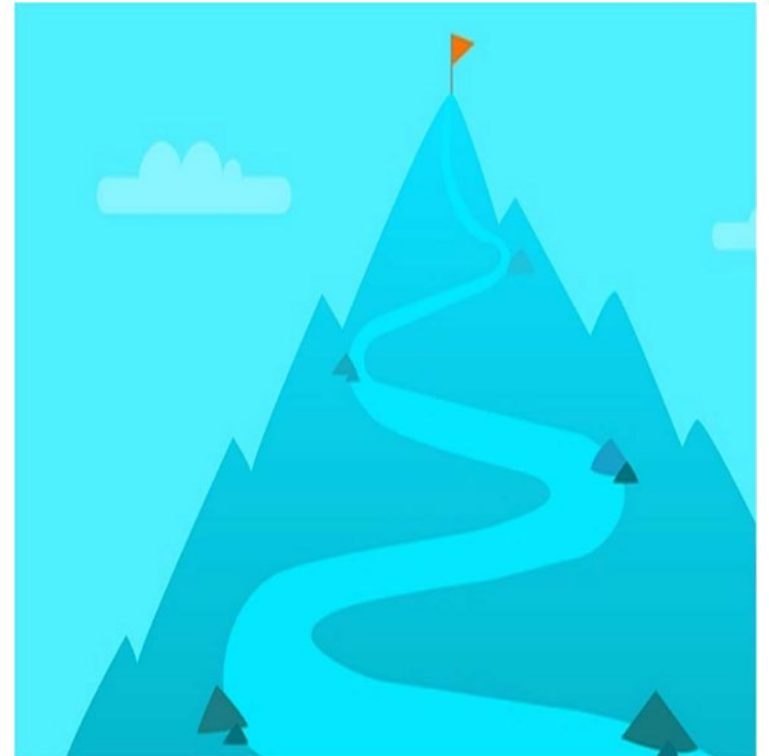
Focus on the application of IGS data and products towards three specific areas:

- 1) Global and Regional Air Quality,
- 2) Climate Monitoring and
- 3) Improving Weather Prediction.

IAG Inter-Commission Committee on Geodesy for Climate Research (ICCC) to enhance the use of geodetic observations for climate studies.

Challenges in the region

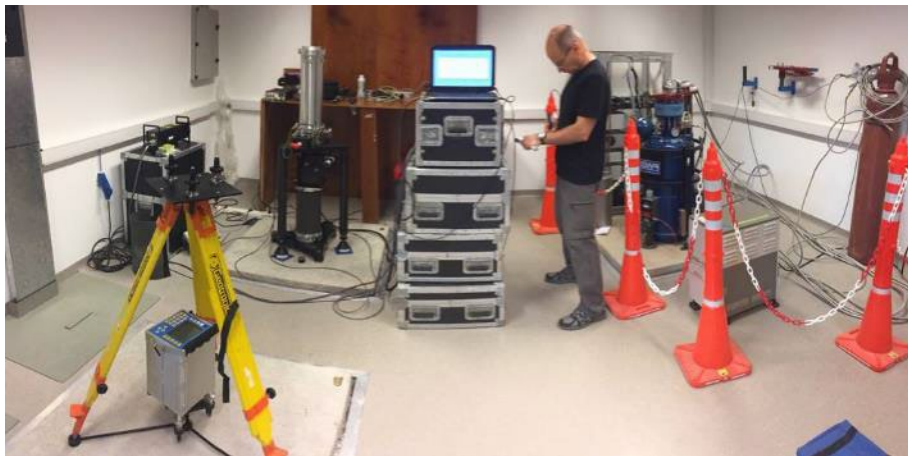
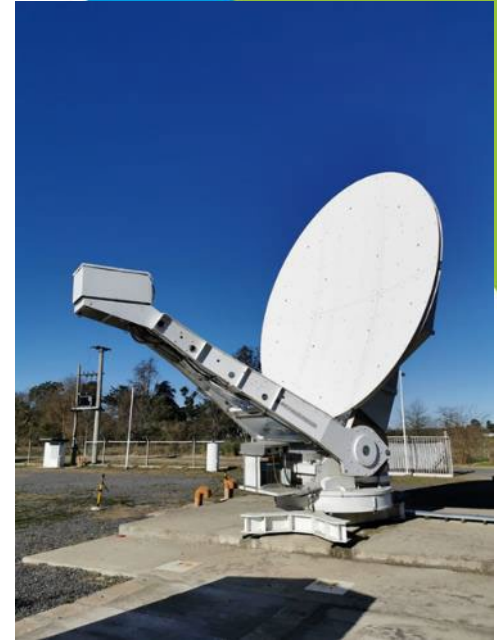
- The heterogeneous situation in the countries of the región - what needs to be achieved is different in each country;
- Coordination and funding must be intensified for better national Geodetic Infrastructures;
- Lack of coverage in the Regional Geodetic Infrastructure;
- Restrictions regarding open data sharing;
- Need to expand capacities through Education and Training to make the best use of the GGRF;
- Better understanding of **decision-makers** regarding the importance of geodesy for the societal development



We need to build a strong international cooperation

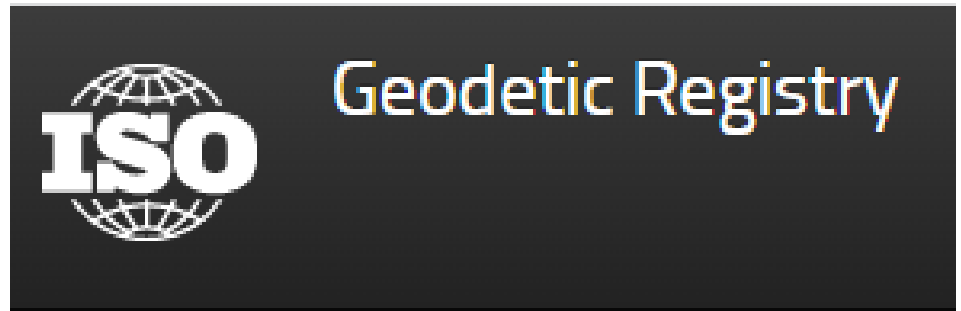
Actions: Geodetic Infrastructure

- Carry out studies to define what type of geodetic infrastructure is required at the regional level and in each country
- Develop, implement and communicate national and regional geodesy development plans
- Develop educational materials (guidelines) to help countries densify their geodetic infrastructure
- More Geodetic Observatories in the region



Actions: Policies, Standards and Conventions

- Actions: Policies, Standards and Conventions
- Implement a data sharing strategy and promote open geodetic data
- Apply standards, policies and conventions for the generation of consistent geodetic products
- Publish official definitions and transformations of reference frames in the ISO Geodetic Register (and other similar registers)



Actions: Education, Training and Capacity Development

- Carry out capacity assessments and educational demands of the countries to establish training needs in geodesy
- Develop a capacity development program based on the guidelines of the United Nations Development Program, the United Nations Subcommittee on Geodesy, the IAG and SIRGAS
- Develop collaboration agreements with scientific institutions / academia / government to develop and distribute geodesy educational resources
- Participate and collaborate with SIRGAS to expand geodesy educational resources and distribute them to the entire community through its website



Actions: Communication and Dissemination

- Develop and implement a communication and outreach strategy
- Create strategic messages and develop communication methods, including social media
- Demonstrate how geodesy can play a key role in solving social, environmental and economic problems





UN-GGIM: Global Geodetic Reference Frame (GGRF) for Sustainable Development - GGRF Roadmap – key areas of Action

Governance

The governance structure and mechanisms must be improved to ensure the maintenance and development of the GGRF

Data sharing

Geodetic standards and open data sharing are required to expand and strengthen the GGRF

Education and capacity building

Appropriate geodetic skills and educational programs are essential for the development, sustainability and utilization of the GGRF.

Communication and outreach

Develop communication and outreach programmes that enable the GGRF to be more visible and understandable to society

Geodetic infrastructure

A more homogeneous distribution of geodetic infrastructure is needed to develop and utilize an accurate GGRF.

Resolution 2021/9 approved at the Eighth Session of the UN-GGIM Americas and the SIRGAS Directing Council, regarding the opening of GNSS repositories

Resolution Proposal – to advance in the implementation of the geodetic frameworks of the continent through the International Reference Systems - ITRS, IHRS and ITGRF

Resolution 1

To advance on the implementation of the United Nations (UN) General Assembly Resolution on the Global Geodetic Reference Frame (UN-GGRF) for Sustainable Development in the Americas and Caribbean region

- Recognize the realization of the International Terrestrial Reference System (ITRS), the International Height Reference System (IHRF), and the International Terrestrial Gravity Reference System (ITGRS), the basis of the GGRF, is given by their respective reference frames ITRF (International Terrestrial Reference Frame), IHRF (International Height Reference Frame) and ITGRF (International Terrestrial Gravity Reference Frame);
- Recognize the most common way people access the GGRF for geometric positioning is via Global Navigation Satellite Systems (GNSS) and its receivers, now embedded in cellphones and mobile devices around the world;
- Recognize the limited access to the WGS84 (World Geodetic System) reference frame and its poor geometric compatibility (at the decimeter level) relative to ITRF, the reference frame adopted for the GGRF;
- Recognize to improve the accuracy and accessibility of the GGRF, more and better instruments are needed, as well as sustainable financing for data processing and analysis that enable the generation of products and services;

Resolution 1

To advance on the implementation of the United Nations (UN) General Assembly Resolution on the Global Geodetic Reference Frame (UN-GGRF) for Sustainable Development in the Americas and Caribbean region

- Urge the Member States to develop geodetic capabilities within the Americas and the Caribbean for the establishment and maintenance of a high-precision geocentric network **as densification of the ITRF, IHRF, and ITGRF on the continent;**
- Urge the Member States to make the necessary efforts to link and **align their national geodetic infrastructures towards the ITRF, IHRF, and ITGRF**, to ensure the development, sustainability and promotion of the GGRF;
- Support the countries of the region **to include GNSS stations in the SIRGAS continuous operating network, as well as height and gravity stations throughout the Americas and the Caribbean**, with the objective of GGRF implementation in all member states;

Resolution 2

The support of American Nations for the establishment of the GGCE in Germany

- Urge the Member States and relevant regional organizations to support the strengthening of the United Nations Global Geodetic Center of Excellence (GGCE), located in Bonn, Germany, and participate to ensure the exchange of experiences and best practices to facilitate the implementation of the GGRF globally.

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Thank you
for your attention