The ISO Geodetic Register

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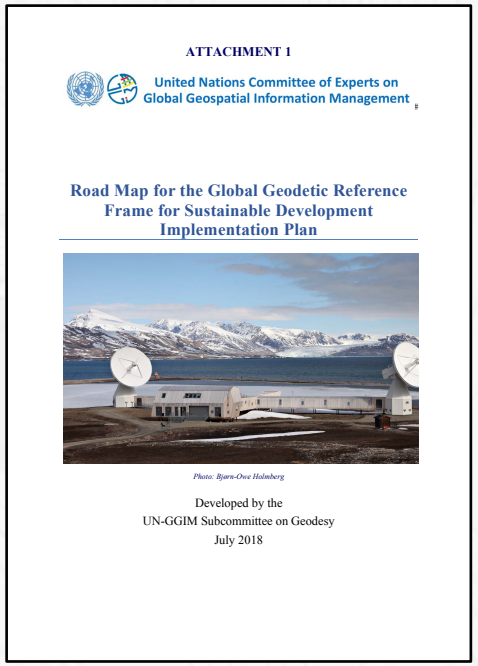
Outline

Description of the ISO Geodetic Registry
SIRGAS content in the ISOGR
Planned new content
How to submit new content

What is a register?

- Registers & registries
  - Register – a structured database of information with unique identifiers
  - Registry – implementation of the structured database (e.g., spreadsheet, web app)
- The need for geodetic registers
  - To unambiguously identify the different coordinate reference systems and transformations used to manage geospatial data – primarily in GIS software
  - To foster interoperability of geodetic data and products
  - To support the implementation of the UN-GGIM Global Geodetic Reference Frame
  - *GGRF Implementation Plan recommends that Member States enter their reference system information into the ISO Geodetic Register*



ATTACHMENT 1

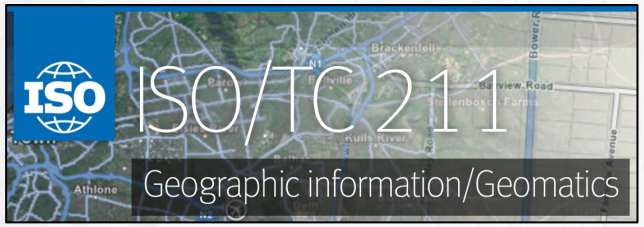
United Nations Committee of Experts on Global Geospatial Information Management

Road Map for the Global Geodetic Reference Frame for Sustainable Development Implementation Plan

Photo: Bjørn-Owe Holmberg

Developed by the
UN-GGIM Subcommittee on Geodesy
July 2018

The ISO Geodetic Register (ISOGR)



- Provided by the ISO Technical Committee on geographic information/ geomatics (ISO/TC 211) – released Dec 2018
- Conforms to ISO standards (next slide)
- *Main purpose is to serve as the authoritative source for reference frames and transformations*
  - Information in the ISO Geodetic Register has been either directly entered or approved by the agencies responsible for defining & maintaining the reference systems and transformations
  - All information is reviewed and approved by a "Control Body" of geodetic experts chaired by representatives of the IAG (current chair: Dr Michael Craymer)
- Also serves as an authoritative source for other registers (e.g., EPSG)
  - Not meant to complete with other registries but complement them

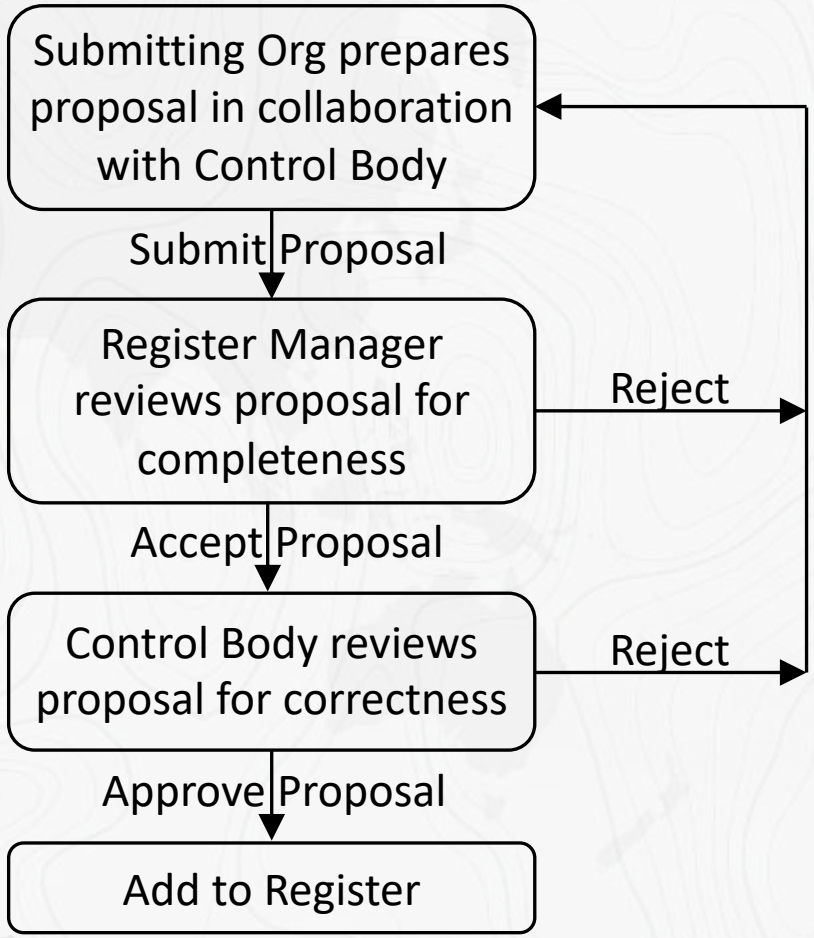
The ISO Geodetic Register (ISOGR)

- Follows ISO standards
- Primary Standards
  - ISO 19127 – ISO Geodetic Register
  - ISO 19135 – Procedures for item registration
  - ISO 19111 – Referencing by coordinates
- Other ISO standards used for
  - Date, time and coordinate formats
  - Geography Markup Language (GML) output
  - Well Known Text representation output
  - Many others

ISO 19127 & 19135

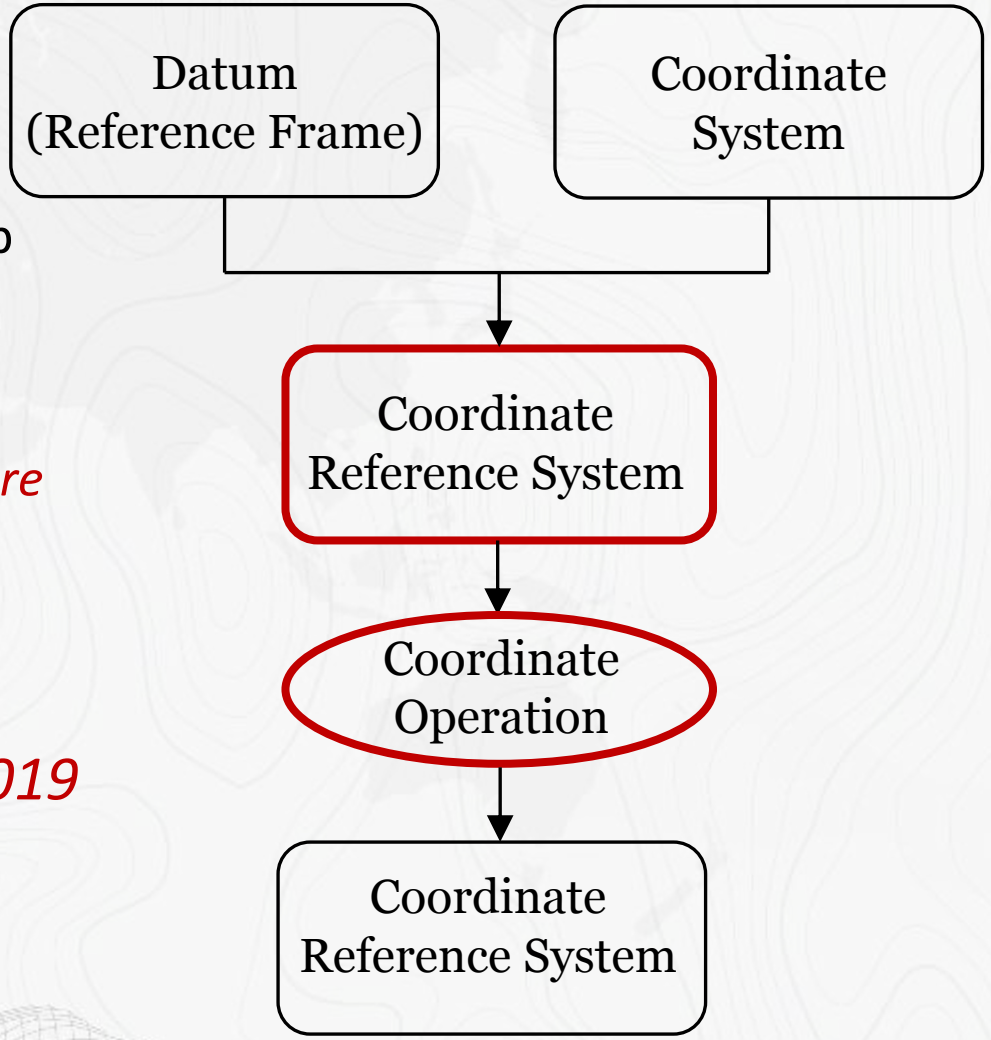
- Defines the procedures for preparing, managing & maintaining the ISOGR
- **Types of submissions (proposals)**
  - Addition of new data
  - Clarification/correction of existing data
  - Supersession (updating) of existing data
  - Retirement of existing data (no longer used but retained for historical purposes)
  - Invalidation of existing erroneous data

Proposal Approval Process



ISO 19111

- Defines the elements that describe
  - Datums (reference frames)
  - Coordinate systems (Cartesian, ellipsoidal, heights, map projections)
  - *Coordinate Reference Systems (CRS)*
  - Coordinate operations (conversions & transformations)
  - *CRS & operation identifiers primarily used in GIS software*
- Current ISOGR Registry follows 19111:2007
  - Static datums only
  - Does not explicitly support geoid-based datums
- *New ISOGR Registry being developed for 19111:2019*
  - Dynamic datums
  - Epoch propagation (point motion operations)
  - Geoid-based datums
  - Migrating to a more efficient open-source platform



Geodetic Registry

https://geodetic.isotc211.org

Documentation Login Feedback

- Welcome
- ISO Geodetic Register
  - Coordinate Reference Systems
  - Coordinate Systems
  - Datums
  - Coordinate Operations
  - Other

ISO Geodetic Registry (ISOGR)

The ISO Geodetic Registry is a structured database of coordinate reference systems (CRS) and transformations that is accessible through this online registry system. The Register includes only systems and transformations of international application. It does not include all possible coordinate reference systems and transformations.

This Registry is provided under the auspices of ISO Technical Committee 211 on geographic information/geomatics and conforms to the following ISO standards:

- ISO 19111:2007 (Spatial referencing by coordinates)
- ISO 19127:2019 (Geodetic register)
- ISO 19135-1:2015 (Procedures for item registration -- Part 1: Fundamentals)

Work is also underway to upgrade the Registry to conform to the recently revised ISO 19111:2019 standard, which includes support for dynamic datums and geoid-based datums.

July 2022: ISO/TC 211, OGC and IOGP have jointly published the "Guide to Coordinate Reference System (CRS) Resources". The guide describes basic information and the intended purposes of the three authoritative CRS registers: EPSG, ISO Geodetic and OGC CRS registries, for the user community.

Usage and license

The Registry may be used free of charge but its use is subject to acceptance of the Terms of Use. Use of the Registry implies acceptance of these Terms of Use.

Users of the Registry may query and view data and generate reports via anonymous guest access. Only approved authoritative agencies may submit proposals for new additions or clarifications to the Registry. Authoritative agencies may request to register for submissions using the Feedback page.

Registration Authority

Ribose was appointed as Registration Authority of the ISO Geodetic Register by ISO in 2019 in accordance to ISO/TMB resolution 4/2019 and ISO/TC 211 Resolution 912. As Registration Authority, Ribose is responsible for providing registration services for the ISO Geodetic Register following the ISO 19127 International Standard.

Contacting us

If you encounter issues or have any questions about the ISO Geodetic Register, please use the Feedback page to submit them. A member of the team will reach out to you directly.

Sponsors

The ISO Geodetic Register is made available to the public free of charge with financial support provided by the following sponsors:

Ribose

Kartverket

Natural Resources Canada / Ressources naturelles Canada

IGN INSTITUT NATIONAL DE L'INFORMATION GÉOGRAPHIQUE ET FORESTIÈRE

Last updated: 2022-08-29T13:39Z -2c0f2a3

POWERED BY Ribose

Current Content

977 register items

92 reference frames
30 vertical datums

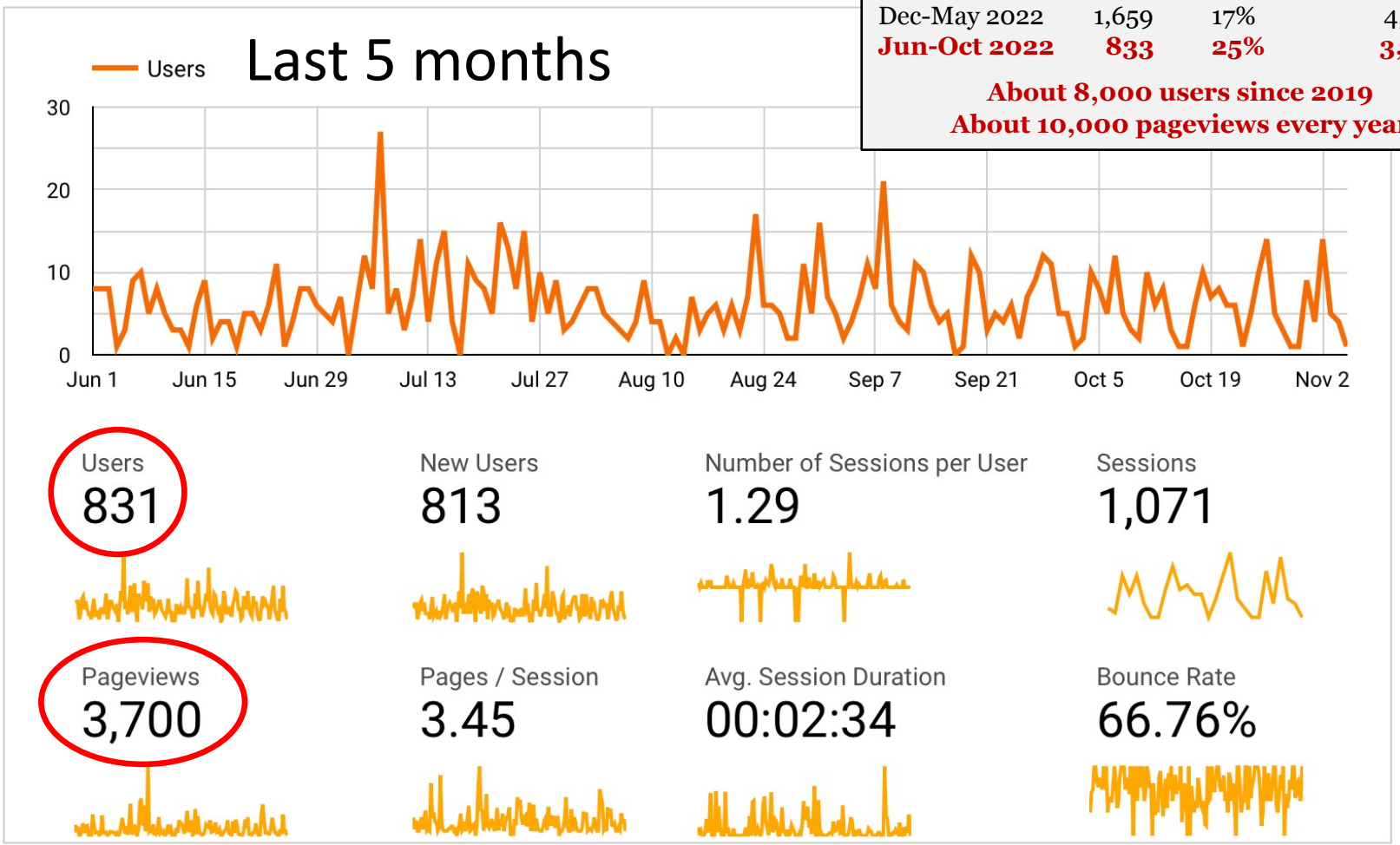
258 geodetic CRSs
30 vertical CRSs

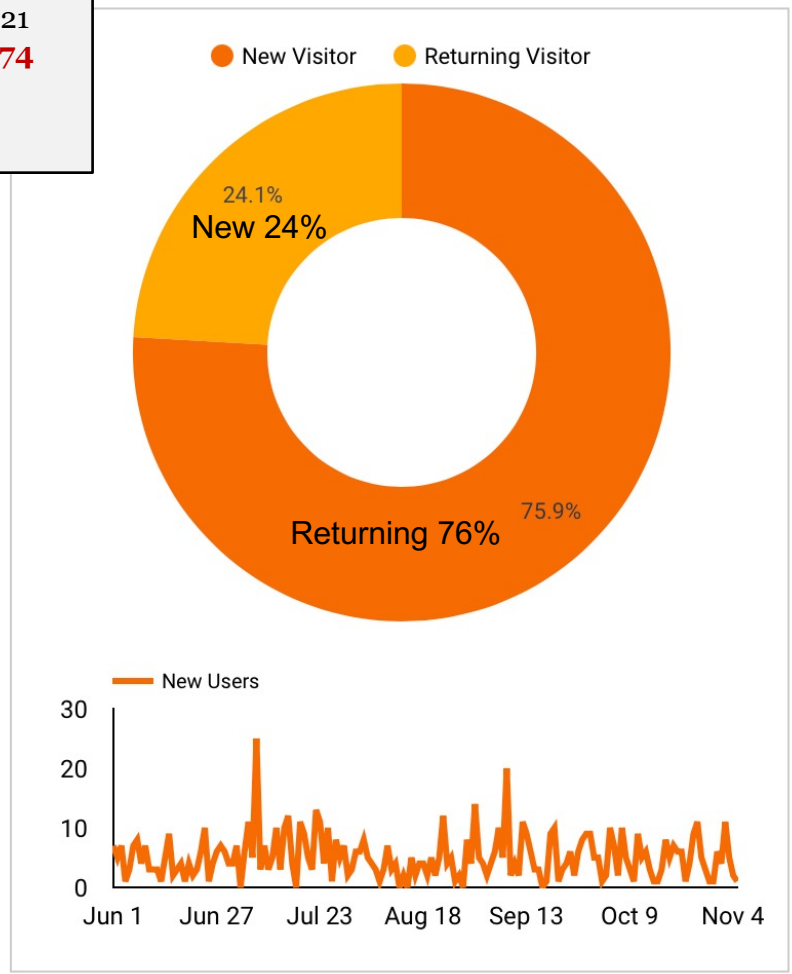
122 conversions
322 transformations

ISOGR Usage

	Users	Returning	Pageviews
Jun-Nov 2019	681	37%	7,104
Dec-May 2020.	733	33%	5,520
Jun-Nov 2020	964	38%	11,826
Dec-May 2021	2,237	36%	9,228
Jun-Nov 2021	1,412	22%	4,990
Dec-May 2022	1,659	17%	4,621
Jun-Oct 2022	**833**	**25%**	**3,774**

About 8,000 users since 2019
About 10,000 pageviews every year





SIRGAS Content

- List of SIRGAS datums (2) & CRSs (6)
- Example of information for the SIRGAS2000 CRS

- List of SIRGAS-CON datums (16)
- Example of information for the SIR17P01 datum

- List of SIRGAS transformations (18)

Geodetic Registry

Documentation Login Feedback

- Welcome
- ISO Geodetic Register
  - Coordinate Reference Systems
  - Coordinate Systems
  - Datums
    - Engineering Datum
    - Geodetic Datum
    - Vertical Datum
  - Coordinate Operations

Geodetic Datum

SIRGAS95 & SIRGAS2000

Overview | Contents

Show 100 items per page

Sistema

Identifier	Name	Item class	Status	
150	Sistema de Referencia Geocentrico para America del Sur 1995	Geodetic Datum	valid	Details
169	Sistema de Referencia Geocentrico para America del Sur 2000	Geodetic Datum	valid	Details

- Welcome
- ISO Geodetic Register
  - Coordinate Reference Systems
    - Compound CRS
    - Engineering CRS
    - Geodetic CRS
    - Projected CRS
    - Vertical CRS
  - Coordinate Systems
  - Datums
  - Coordinate Operations
  - Other

Geodetic CRS

Overview | Contents

Show 100 items per page

SIRGAS95

Identifier	Name	Item class	Status	
278	SIRGAS95 - XYZ	Geodetic CRS	valid	Details
306	SIRGAS95 - LatLonEHt	Geodetic CRS	valid	Details
318	SIRGAS95 - LatLon	Geodetic CRS	valid	Details
313	SIRGAS2000 - LatLonEHt	Geodetic CRS	valid	Details
384	SIRGAS2000 - XYZ	Geodetic CRS	valid	Details
398	SIRGAS2000 - LatLon	Geodetic CRS	valid	Details

Showing 1 to 3 of 3 items

Previous 1 Next

Item details | Management information

Download PDF

Geodetic CRS

Name

SIRGAS2000 - LatLonEHt

Identifier

313

Show GML Show WKT

Alias
Geocentric Reference System for South America
Geocentric Reference System for the Americas
SIRGAS 2000
SIRGAS2000
Sistema de Referencia Geocentrico para las Americas
South American Geocentric Reference System 2000

Scope

Spatial referencing

Remarks

Extent

South America - onshore and offshore. Central America - onshore and offshore. Mexico - onshore and offshore.

Datum

Sistema de Referencia Geocentrico para America del Sur 2000

Coordinate System

Ellipsoidal 3D CS. Axes: latitude, longitude, ellipsoidal height. Orientations: north, east, up. UoM: degree, degree, metre.

Base CRS

[undefined]

Operation

[undefined]

Information Source

1. Results of the SIRGAS campaign 2000 and coordinates variations with respect to the 1995 South American geocentric reference frame
2. Deformation of the South American crust estimated from finite element and collocation methods
3. Sistema de Referencia Geocentrico para las Americas (SIRGAS)

Geodetic Registry

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- Welcome
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  - Datums
    - Engineering Datum
    - Geodetic Datum
    - Vertical Datum
  - Coordinate Operations
  - Other

Geodetic Datum

SIRGAS-CON Reference Frames (16)

Overview | Contents

Show 100 items per page

SIRGAS

Identifier	Name	Item class	Status	
98	SIRGAS Continuously Operating Network DGF07P01	Geodetic Datum	valid	Details
109	SIRGAS Continuously Operating Network SIR15P01	Geodetic Datum	valid	Details
124	SIRGAS Continuously Operating Network DGF06P01	Geodetic Datum	valid	Details
125	SIRGAS Continuously Operating Network DGF05P01	Geodetic Datum	valid	Details
129	SIRGAS Continuously Operating Network SIR17P01	Geodetic Datum	valid	Details
133	SIRGAS Continuously Operating Network DGF00P01	Geodetic Datum	valid	Details
136	SIRGAS Continuously Operating Network DGF01P02	Geodetic Datum	valid	Details
151	SIRGAS Continuously Operating Network SIR10P01	Geodetic Datum	valid	Details
160	SIRGAS Continuously Operating Network DGF04P01	Geodetic Datum	valid	Details
171	SIRGAS Continuously Operating Network DGF02P01	Geodetic Datum	valid	Details
173	SIRGAS Continuously Operating Network DGF01P01	Geodetic Datum	valid	Details
174	SIRGAS Continuously Operating Network SIR11P01	Geodetic Datum	valid	Details
177	SIRGAS Continuously Operating Network SIR13P01	Geodetic Datum	valid	Details
181	SIRGAS Continuously Operating Network SIR09P01	Geodetic Datum	valid	Details
184	SIRGAS Continuously Operating Network DGF08P01	Geodetic Datum	valid	Details
189	SIRGAS Continuously Operating Network SIR14P01	Geodetic Datum	valid	Details

Item details | Management information

Download PDF

Geodetic Datum

Name

SIRGAS Continuously Operating Network SIR17P01

Identifier

129

Alias
Geocentric Reference System for the Americas
SIR17P01
SIRGAS
SIRGAS Multi-Year Solution 2017
SIRGAS-CON
Sistema de Referencia Geocentrico para las Americas

Scope

Spatial referencing

Anchor Definition

Realized by a frame of 345 continuously operating stations using GPS and GLONASS observations from April 2011 to January 2017 and aligned to IGS14 at epoch 2015.0. This cumulative solution has been made consistent with the phase centre calibrations referring to the IGS14 reference frame using the latitude-dependent phase centre correction model by the International GNSS Service. Velocity model VEMOS2017 used to propagate coordinates from an arbitrary epoch to the 2015.0 reference epoch.

Extent

South America - onshore and offshore. Central America - onshore and offshore. Mexico - onshore and offshore.

Ellipsoid

GRS 1980

Prime Meridian

Greenwich

Release Date

2018

Coordinate Reference Epoch

2015.0

Remarks

Replaces SIR15P01.

Information Source

1. Velocity model for SIRGAS 2017: VEMOS2017
2. Kinematics of the SIRGAS reference frame
3. Sistema de Referencia Geocentrico para las Americas (SIRGAS)
4. The varying surface kinematics in Latin America: VEMOS 2009, 2015, and 2017
5. SIRGAS reference frame realization SIR17P01

Geodetic Registry

Documentation Login Feedback

- Welcome
- ISO Geodetic Register
  - Coordinate Reference Systems
  - Coordinate Systems
  - Datums
  - Coordinate Operations
    - Concatenated Operation
    - Conversion
    - Transformation
  - Other

18 SIRGAS "Null" Transformations

(SIRGAS is aligned to ITRF/IGS)

Transformation

Overview | Contents

Show 100 items per page

SIRGAS

Identifier	Name	Item class	Status	
485	ITRF2000 to SIRGAS2000 [SIRv1]	Transformation	valid	Details
496	ITRF2000 to SIRGAS-CON DGF01P01 [SIRv1]	Transformation	valid	Details
512	IGS05 to SIRGAS-CON SIR09P01 [SIRv1]	Transformation	valid	Details
513	ITRF2008 to SIRGAS-CON SIR11P01 [SIRv1]	Transformation	valid	Details
525	ITRF94 to SIRGAS95 [SIRv1]	Transformation	valid	Details
536	ITRF2000 to SIRGAS-CON DGF04P01 [SIRv1]	Transformation	valid	Details
549	IGb08 to SIRGAS-CON SIR15P01 [SIRv1]	Transformation	valid	Details
613	ITRF97 to SIRGAS-CON DGF00P01 [SIRv1]	Transformation	valid	Details
626	IGS05 to SIRGAS-CON DGF08P01 [SIRv1]	Transformation	valid	Details
630	IGS14 to SIRGAS-CON SIR17P01 [SIRv1]	Transformation	valid	Details
634	ITRF2000 to SIRGAS-CON DGF02P01 [SIRv1]	Transformation	valid	Details
652	ITRF2000 to SIRGAS-CON DGF01P02 [SIRv1]	Transformation	valid	Details
684	IGb08 to SIRGAS-CON SIR13P01 [SIRv1]	Transformation	valid	Details
688	ITRF2000 to SIRGAS-CON DGF06P01 [SIRv1]	Transformation	valid	Details
694	IGS05 to SIRGAS-CON DGF07P01 [SIRv1]	Transformation	valid	Details
706	IGb08 to SIRGAS-CON SIR14P01 [SIRv1]	Transformation	valid	Details
707	ITRF2000 to SIRGAS-CON DGF05P01 [SIRv1]	Transformation	valid	Details
723	ITRF2008 to SIRGAS-CON SIR10P01 [SIRv1]	Transformation	valid	Details

Planned New Content

- Over a thousand map projections for existing content
- Reference frames used by GNSS systems
  - ✓WGS 84 – GPS (done)
  - PZ-90 – GLONASS
  - GTRF – Galileo
  - CTRF 2000 – BeiDou
  - JGS2010 – QZSS
- National ETRS89 realizations
  - EUREF requesting their members to add their national realizations to the ISOGR
  - Swedish SWEREF99 in progress – dynamic datum
- National SIRGAS realizations
  - Columbian MAGNA-SIRGAS 2018 in progress – see next slide
  - *Encourage all SIRGAS members to add their national SIRGAS realizations in support of the GGRF*

MAGNA-SIRGAS 2018 Data Entry for Review

Datum

Name

Marco Geocentrico Nacional de Referencia 2018

Identifier

Will be assigned automatically

Release Date

2018-06-08

Aliases

× MAGNA-SIRGAS 2018

Coordinate Reference Epoch

2018.0

Scope

Spatial referencing

Remarks

Replaces MAGNA-SIRGAS from 2018-06-08.

Anchor Definition

Densification of ITRF2014 at epoch 2018.0 in Colombia. The MAGNDA-ECO active network (referenced to ITRF2008 at epoch 2011.76) and the MAGNA-PASSIVE network (referenced to ITRF94 at epoch 1995.4) were updated to ITRF2014 using IERS transformations and propagated to epoch 2018 using the VEMOS2009 velocity model.

Extent

Import existing extent

[select one to import extent data]

Description

Colombia - onshore and offshore. Includes San Andres y Providencia, Malpelo Islands, Roncador Bank, Serrana Bank and Serranilla Bank.

Information sources enter below

More Information

- Public access to ISOGR (no registration required)

  https://geodetic.isotc211.org

- Submitting proposals

  Submit request via Feedback option on home page (top-right)

  Or email: michael.craymer@nrcan-rncan.gc.ca