

# ISO Geodetic Registry

|                    |  |  |  |
|--------------------|--|--|--|
| Item class         | GeodeticCRS  |  |  |
| Name               | SIRGAS-CON SIR10P01 - LatLonEHt  |  |  |
| Item status        | VALID  |  |  |
| Identifier         | 211  |  |  |
| Alias              | SIRGAS   |  |  |
| Alias              | SIRGAS-CON   |  |  |
| Alias              | SIRGAS Multi-Year Solution 2010  |  |  |
| Alias              | Geocentric Reference System for the Americas   |  |  |
| Alias              | SIR10P01   |  |  |
| Alias              | Sistema de Referencia Geocentrico para las Americas  |  |  |
| Information source | Title  | The position and velocity solution SIR10P01 of the IGS Regional Network Associate Analysis Centre for SIRGAS (IGS RNAAC SIR)                           |  |
|                    | Author   | W. Seemueller, L. Sanchez, M. Seitz, H. Drewes   |  |
|                    | Publisher  | Deutsches Geodaetisches Forschungsinstitut, Munich, Germany  |  |
|                    | Publication date   | 2010   |  |
|                    | Series/Journal name  | DGFI Report  |  |
|                    | Issue identification   | No. 86   |  |
| Information source | Title  | The 2009 Horizontal Velocity Field for South America and the Caribbean   |  |
|                    | Author   | H. Drewes, O. Heidbach   |  |
|                    | Publisher  | Springer Berlin Heidelberg   |  |
|                    | Publication date   | 2012   |  |
|                    | Series/Journal name  | International Association of Geodesy Symposia  |  |
|                    | Issue identification   | 136.0  |  |
| Information source | Page   | 657-664  |  |
|                    | Other citation details   | In Kenyon S., Pacino M., Marti U. (eds) Geodesy for Planet Earth. International Association of Geodesy Symposia, Vol 136. Springer, Berlin, Heidelberg |  |
|                    | Title  | Sistema de Referencia Geocentrico para las Americas (SIRGAS)   |  |
|                    | Author   | Sistema de Referencia Geocéntrico para las Américas (SIRGAS)   |  |
|                    | Publisher  | Sistema de Referencia Geocéntrico para las Américas (SIRGAS)   |  |
|                    | Publication date   | 2018   |  |
| Data source        | Other citation details   | Website  |  |
|                    | ISO Geodetic Registry  |  |  |
| Scope              | Spatial referencing  |  |  |
| Datum              | SIRGAS Continuously Operating Network SIR10P01   |  |  |
| Coordinate System  | Ellipsoidal 3D CS. Axes: latitude, longitude, ellipsoidal height. Orientations: north, east, up. UoM: degree, degree, metre. |  |  |

## Extent

|                                |   |         |
|--------------------------------|---|---------|
| <i>Description</i>             | <b>South America - onshore and offshore. Central America - onshore and offshore. Mexico - onshore and offshore.</b> |         |
| <i>Geographic Bounding Box</i> | <i>West-bound longitude</i>   | -122.19 |
|                                | <i>North-bound latitude</i>   | 32.72   |

*East-bound longitude*  
*South-bound latitude*

-25.28  
-59.87

# ISO Geodetic Registry

|                            |   |  |
|----------------------------|---|--|
| Item class                 | GeodeticDatum   |  |
| Name                       | SIRGAS Continuously Operating Network<br>SIR10P01   |  |
| Item status                | VALID   |  |
| Identifier                 | 151   |  |
| Alias                      | SIRGAS  |  |
| Alias                      | SIRGAS-CON  |  |
| Alias                      | SIRGAS Multi-Year Solution 2010   |  |
| Alias                      | Geocentric Reference System for the Americas  |  |
| Alias                      | SIR10P01  |  |
| Alias                      | Sistema de Referencia Geocentrico para las Americas   |  |
| Information source         | Title   | The position and velocity solution SIR10P01 of the IGS Regional Network Associate Analysis Centre for SIRGAS (IGS RNAAC SIR) |
|                            | Author  | W. Seemueller, L. Sanchez, M. Seitz, H. Drewes   |
|                            | Publisher   | Deutsches Geodaetisches Forschungsinstitut, Munich, Germany  |
|                            | Publication date  | 2010   |
|                            | Series/Journal name   | DGFI Report  |
|                            | Issue identification  | No. 86   |
| Information source         | Title   | Sistema de Referencia Geocentrico para las Americas (SIRGAS)   |
|                            | Author  | Sistema de Referencia Geocéntrico para las Américas (SIRGAS)   |
|                            | Publisher   | Sistema de Referencia Geocéntrico para las Américas (SIRGAS)   |
|                            | Publication date  | 2018   |
| Information source         | Other citation details  | Website  |
|                            | Title   | The 2009 Horizontal Velocity Field for South America and the Caribbean   |
|                            | Author  | H. Drewes, O. Heidbach   |
|                            | Publisher   | Springer Berlin Heidelberg   |
|                            | Publication date  | 2012   |
|                            | Series/Journal name   | International Association of Geodesy Symposia  |
|                            | Issue identification  | 136.0  |
|                            | Page  | 657-664  |
| Other citation details     | In Kenyon S., Pacino M., Marti U. (eds) Geodesy for Planet Earth. International Association of Geodesy Symposia, Vol 136. Springer, Berlin, Heidelberg  |  |
| Data source                | ISO Geodetic Registry   |  |
| Remarks                    | Replaces SIR09P01. Replaced by SIR11P01.  |  |
| Anchor definition          | Realized by a frame of 183 continuously operating stations using GPS observations from January 2000 to June 2010 and aligned to ITRF2008 at epoch 2005.0. GPS data from January 2000 to November 2006 reprocessed using the first reprocessing campaign products (IG1) of the International GNSS Service and absolute phase centre calibrations referring to the IGS05/IGb05 reference frame. Velocity model VEMOS2009 used to propagate coordinates from an arbitrary epoch to the 2005.0 reference epoch. |  |
| Release date               | 2010  |  |
| Coordinate Reference Epoch | 2005.0  |  |
| Scope                      | Spatial referencing   |  |

|                       |           |
|-----------------------|-----------|
| <i>Ellipsoid</i>      | GRS 1980  |
| <i>Prime Meridian</i> | Greenwich |

## Extent

|                                |   |         |  |
|--------------------------------|---|---------|--|
| <i>Description</i>             | <b>South America - onshore and offshore. Central America - onshore and offshore. Mexico - onshore and offshore.</b> |         |  |
| <i>Geographic Bounding Box</i> | <i>West-bound longitude</i>   | -122.19 |  |
|                                | <i>North-bound latitude</i>   | 32.72   |  |
|                                | <i>East-bound longitude</i>   | -25.28  |  |
|                                | <i>South-bound latitude</i>   | -59.87  |  |

# ISO Geodetic Registry

|                             |  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
|-----------------------------|--|--------------|--------------------------------|---------------|-----------|------------------|--------------------------------------|-------------------------|---------|----------------------------|---------------------|-----------------------------|------------------|-------------|---------|
| <i>Item class</i>           | Ellipsoid  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Name</i>                 | <b>GRS 1980</b>  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Item status</i>          | VALID  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Identifier</i>           | 27   |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Alias</i>                | Geodetic Reference System 1980   |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Alias</i>                | GRS1980  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Alias</i>                | IAG GRS80  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Alias</i>                | International 1979   |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Alias</i>                | GRS80  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Information source</i>   | <table> <tr> <td><i>Title</i></td><td>Geodetic Reference System 1980</td></tr> <tr> <td><i>Author</i></td><td>H. Moritz</td></tr> <tr> <td><i>Publisher</i></td><td>Springer International Publishing</td></tr> <tr> <td><i>Publication date</i></td><td>2003-03</td></tr> <tr> <td><i>Series/Journal name</i></td><td>Journal of Geodesy</td></tr> <tr> <td><i>Issue identification</i></td><td>Volume 74, No. 1</td></tr> <tr> <td><i>Page</i></td><td>128–162</td></tr> </table>  | <i>Title</i> | Geodetic Reference System 1980 | <i>Author</i> | H. Moritz | <i>Publisher</i> | Springer International Publishing    | <i>Publication date</i> | 2003-03 | <i>Series/Journal name</i> | Journal of Geodesy  | <i>Issue identification</i> | Volume 74, No. 1 | <i>Page</i> | 128–162 |
| <i>Title</i>                | Geodetic Reference System 1980   |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Author</i>               | H. Moritz  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Publisher</i>            | Springer International Publishing  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Publication date</i>     | 2003-03  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Series/Journal name</i>  | Journal of Geodesy   |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Issue identification</i> | Volume 74, No. 1   |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Page</i>                 | 128–162  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Information source</i>   | <table> <tr> <td><i>Title</i></td><td>Geodetic Reference System 1980</td></tr> <tr> <td><i>Author</i></td><td>H. Moritz</td></tr> <tr> <td><i>Publisher</i></td><td>International Association of Geodesy</td></tr> <tr> <td><i>Publication date</i></td><td>1984</td></tr> <tr> <td><i>Series/Journal name</i></td><td>Bulletin Geodesique</td></tr> <tr> <td><i>Issue identification</i></td><td>Volume 58, No. 3</td></tr> <tr> <td><i>Page</i></td><td>395-405</td></tr> </table> | <i>Title</i> | Geodetic Reference System 1980 | <i>Author</i> | H. Moritz | <i>Publisher</i> | International Association of Geodesy | <i>Publication date</i> | 1984    | <i>Series/Journal name</i> | Bulletin Geodesique | <i>Issue identification</i> | Volume 58, No. 3 | <i>Page</i> | 395-405 |
| <i>Title</i>                | Geodetic Reference System 1980   |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Author</i>               | H. Moritz  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Publisher</i>            | International Association of Geodesy   |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Publication date</i>     | 1984   |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Series/Journal name</i>  | Bulletin Geodesique  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Issue identification</i> | Volume 58, No. 3   |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Page</i>                 | 395-405  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Data source</i>          | ISO Geodetic Registry  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Remarks</i>              | Adopted by IUGG 1979 Canberra. Inverse flattening is derived from geocentric gravitational constant $GM = 3986005e8 \text{ m}^3/\text{s}^2$ , dynamic form factor $J_2 = 108263e-8$ and Earth's angular velocity = $7292115e-11 \text{ rad/s}$ .   |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Semi-major axis</i>      | 6378137.0 m  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
| <i>Inverse flattening</i>   | 298.257222101 m  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |

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|                            |                               |   |
|----------------------------|-------------------------------|---|
| <i>Item class</i>          | PrimeMeridian                 |   |
| <i>Name</i>                | <b>Greenwich</b>              |   |
| <i>Item status</i>         | VALID                         |   |
| <i>Identifier</i>          | 25                            |   |
| <i>Alias</i>               | Zero meridian                 |   |
| <i>Information source</i>  | <i>Title</i>                  | Why the Greenwich meridian moved                                |
|                            | <i>Author</i>                 | S. Malys, J.H. Seago, N.K. Pavlis, P.K. Seidelmann, G.H. Kaplan |
|                            | <i>Publisher</i>              | Springer International Publishing                               |
|                            | <i>Publication date</i>       | 2015-12   |
|                            | <i>Series/Journal name</i>    | Journal of Geodesy  |
|                            | <i>Issue identification</i>   | Volume 89, No. 12   |
|                            | <i>Page</i>                   | 1263–1272   |
| <i>Information source</i>  | <i>Title</i>                  | IERS Conventions (2010)   |
|                            | <i>Author</i>                 | G. Petit, B.J. Luzum (eds)                                      |
|                            | <i>Publisher</i>              | Verlag des Bundesamts für Kartographie und Geodäsie             |
|                            | <i>Publication date</i>       | 2010  |
|                            | <i>Edition date</i>           |   |
|                            | <i>Series/Journal name</i>    | IERS Technical Notes  |
|                            | <i>Issue identification</i>   | 36.0  |
| <i>Data source</i>         | <i>Other citation details</i> | ISSN: 1019-4568   |
|                            | ISO Geodetic Registry         |   |
| <i>Greenwich longitude</i> | 0.0 °                         |   |

# ISO Geodetic Registry

|                           |  |   |
|---------------------------|--|---|
| <i>Item class</i>         | EllipsoidalCS  |   |
| <i>Name</i>               | <b>Ellipsoidal 3D CS. Axes: latitude, longitude, ellipsoidal height. Orientations: north, east, up. UoM: degree, degree, metre.</b>  |   |
| <i>Item status</i>        | VALID  |   |
| <i>Identifier</i>         | 46   |   |
| <i>Information source</i> | <i>Title</i>   | ISO 19111 Geographical information - Spatial referencing by coordinates |
|                           | <i>Author</i>  | International Organization for Standardization (ISO)                    |
|                           | <i>Publisher</i>   | International Organization for Standardization (ISO)                    |
|                           | <i>Publication date</i>  | 2007-07-01  |
|                           | <i>Edition</i>   | Second Edition  |
|                           | <i>Series/Journal name</i>   | International Standard  |
|                           | <i>Issue identification</i>  | ISO 19111:2007  |
| <i>Data source</i>        | ISO Geodetic Registry  |   |
| <i>Remarks</i>            | Used in geographic 3D coordinate reference systems. Horizontal coordinates referenced to this CS are in degrees. Any degree representation (e.g. DMSH, decimal, etc.) may be used but that used must be declared for the user. |   |

## Axes

|                           |   |   |
|---------------------------|---|---|
| <i>Item class</i>         | CoordinateSystemAxis  |   |
| <i>Name</i>               | <b>Geodetic latitude</b>  |   |
| <i>Item status</i>        | VALID   |   |
| <i>Identifier</i>         | 38  |   |
| <i>Information source</i> | <i>Title</i>  | ISO 19111 Geographical information - Spatial referencing by coordinates |
|                           | <i>Author</i>   | International Organization for Standardization (ISO)                    |
|                           | <i>Publisher</i>  | International Organization for Standardization (ISO)                    |
|                           | <i>Publication date</i>   | 2007-07-01  |
|                           | <i>Edition</i>  | Second Edition  |
|                           | <i>Series/Journal name</i>  | International Standard  |
|                           | <i>Issue identification</i>   | ISO 19111:2007  |
| <i>Data source</i>        | ISO Geodetic Registry   |   |
| <i>Remarks</i>            | Used in geographic 2D and geographic 3D coordinate reference systems. |   |
| <i>Abbreviation</i>       | Lat   |   |
| <i>Direction</i>          | north   |   |
| <i>Unit</i>               | degree (supplier to define representation)                            |   |

  

|                           |                           |   |
|---------------------------|---------------------------|---|
| <i>Item class</i>         | CoordinateSystemAxis      |   |
| <i>Name</i>               | <b>Geodetic longitude</b> |   |
| <i>Item status</i>        | VALID                     |   |
| <i>Identifier</i>         | 34                        |   |
| <i>Information source</i> | <i>Title</i>              | ISO 19111 Geographical information - Spatial referencing by coordinates |
|                           | <i>Author</i>             | International Organization for Standardization (ISO)                    |

|                     |   |  |
|---------------------|---|--|
|                     | <i>Publisher</i>  | International Organization for Standardization (ISO) |
|                     | <i>Publication date</i>   | 2007-07-01   |
|                     | <i>Edition</i>  | Second Edition                                       |
|                     | <i>Series/Journal name</i>  | International Standard                               |
|                     | <i>Issue identification</i>   | ISO 19111:2007                                       |
| <i>Data source</i>  | ISO Geodetic Registry   |  |
| <i>Remarks</i>      | Used in geographic 2D and geographic 3D coordinate reference systems. |  |
| <i>Abbreviation</i> | Lon   |  |
| <i>Direction</i>    | east  |  |
| <i>Unit</i>         | degree (supplier to define representation)                            |  |

  

|                           |  |   |
|---------------------------|--|---|
| <i>Item class</i>         | CoordinateSystemAxis   |   |
| <i>Name</i>               | <b>Ellipsoidal height</b>  |   |
| <i>Item status</i>        | VALID  |   |
| <i>Identifier</i>         | 36   |   |
| <i>Information source</i> | <i>Title</i>   | ISO 19111 Geographical information - Spatial referencing by coordinates |
|                           | <i>Author</i>  | International Organization for Standardization (ISO)                    |
|                           | <i>Publisher</i>   | International Organization for Standardization (ISO)                    |
|                           | <i>Publication date</i>  | 2007-07-01  |
|                           | <i>Edition</i>   | Second Edition  |
|                           | <i>Series/Journal name</i>   | International Standard  |
|                           | <i>Issue identification</i>  | ISO 19111:2007  |
| <i>Data source</i>        | ISO Geodetic Registry  |   |
| <i>Remarks</i>            | Used only as part of an ellipsoidal 3D coordinate system in a geographic 3D coordinate reference system, never on its own. |   |
| <i>Abbreviation</i>       | h  |   |
| <i>Direction</i>          | up   |   |
| <i>Unit</i>               | metre  |   |