

## ISO Geodetic Registry

|                    |                       |  |  |
|--------------------|-----------------------|--|--|
| Item class         | GeodeticCRS           |  |  |
| Name               | ETRF89 - LatLon       |  |  |
| Item status        | VALID                 |  |  |
| Identifier         | 247                   |  |  |
| Alias              | ETRF89                |  |  |
| Alias              | ETRS89-XYZ            |  |  |
| Alias              | ETRS89 / (X, Y, Z)    |  |  |
| Alias              | EUREF89               |  |  |
| Information source | Title                 | EUREF Technical Note 1: Relationship and Transformation between the International and the European Terrestrial Reference Systems |  |
|                    | Author                | Z. Altamimi  |  |
|                    | Publisher             | Institut National de l'Information Géographique et Forestière (IGN), France  |  |
|                    | Publication date      | 2018-06-28   |  |
|                    | Series/Journal name   | IERS Technical Note  |  |
|                    | Issue identification  | 1.0  |  |
| Information source | Title                 | Report on the Symposium of the IAG Subcommission for the EUREF held in Vienna 14 and 16 August 1991                              |  |
|                    | Author                | IAG  |  |
|                    | Publisher             | Verlag des Bayerischen Akademie der Wissenschaften   |  |
|                    | Publication date      | 1992   |  |
|                    | Edition date          |  |  |
|                    | Series/Journal name   | IAG Subcommission for the European Reference Frame (EUREF) Publication   |  |
|                    | Issue identification  | 1.0  |  |
| Information source | Title                 | ETRS89 realization: Current status, ETRF2005 and Future Development  |  |
|                    | Author                | Z. Altamimi  |  |
|                    | Publication date      | 2008-06-17   |  |
|                    | Edition date          |  |  |
| Information source | Title                 | Report on the Symposium of the IAG Subcommission for the EUREF held in Berne 4 - 6 March 1992                                    |  |
|                    | Author                | IAG  |  |
|                    | Publisher             | Verlag des Bayerischen Akademie der Wissenschaften   |  |
|                    | Publication date      | 1992   |  |
|                    | Edition date          |  |  |
|                    | Series/Journal name   | IAG Subcommission for the European Reference Frame (EUREF) Publication   |  |
|                    | Issue identification  | 1.0  |  |
| Information source | Title                 | Report on the Symposium of the IAG Subcommission for the EUREF held in Florence 28 - 31 May 1990                                 |  |
|                    | Author                | IAG  |  |
|                    | Publisher             | Verlag des Bayerischen Akademie der Wissenschaften   |  |
|                    | Publication date      | 1992   |  |
|                    | Edition date          |  |  |
|                    | Series/Journal name   | IAG Subcommission for the European Reference Frame (EUREF) Publication   |  |
|                    | Issue identification  | 1.0  |  |
| Data source        | ISO Geodetic Registry |  |  |

|                          |   |
|--------------------------|---|
| <i>Remarks</i>           | The distinction in usage between ETRF89 and ETRS89 is confused: although in principle conceptually different in practice both are used as synonyms. |
| <i>Scope</i>             | Spatial referencing   |
| <i>Datum</i>             | European Terrestrial Reference Frame 1989   |
| <i>Coordinate System</i> | Ellipsoidal 2D CS. Axes: latitude, longitude. Orientations: north, east. UoM: degree  |

## Extent

|                                |   |       |  |
|--------------------------------|---|-------|--|
| <i>Description</i>             | <b>Europe - onshore and offshore: Albania, Andorra, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Faroe Islands, Finland, France, Germany, Gibraltar, Greece, Hungary, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Monaco, Montenegro, Netherlands, Norway including Svalbard and Jan Mayen, Poland, Portugal, Romania, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom (UK) including Channel Islands and Isle of Man, Vatican City State.</b> |       |  |
| <i>Geographic Bounding Box</i> | <i>West-bound longitude</i>   | -16.1 |  |
|                                | <i>North-bound latitude</i>   | 84.17 |  |
|                                | <i>East-bound longitude</i>   | 39.65 |  |
|                                | <i>South-bound latitude</i>   | 32.88 |  |

# ISO Geodetic Registry

|                           |  |  |
|---------------------------|--|--|
| <i>Item class</i>         | GeodeticDatum                                    |  |
| <i>Name</i>               | <b>European Terrestrial Reference Frame 1989</b> |  |
| <i>Item status</i>        | VALID  |  |
| <i>Identifier</i>         | 128  |  |
| <i>Alias</i>              | ETRF89   |  |
| <i>Alias</i>              | EUREF 89   |  |
| <i>Alias</i>              | European Terrestrial Reference System 1989       |  |
| <i>Alias</i>              | ETRS89   |  |
| <i>Alias</i>              | ETRS 89  |  |
| <i>Information source</i> | <i>Title</i>                                     | Report on the Symposium of the IAG Subcommission for the EUREF held in Vienna 14 and 16 August 1991                              |
|                           | <i>Author</i>                                    | IAG  |
|                           | <i>Publisher</i>                                 | Verlag des Bayerischen Akademie der Wissenschaften   |
|                           | <i>Publication date</i>                          | 1992   |
|                           | <i>Edition date</i>                              |  |
|                           | <i>Series/Journal name</i>                       | IAG Subcommission for the European Reference Frame (EUREF) Publication   |
|                           | <i>Issue identification</i>                      | 1.0  |
| <i>Information source</i> | <i>Title</i>                                     | EUREF Technical Note 1: Relationship and Transformation between the International and the European Terrestrial Reference Systems |
|                           | <i>Author</i>                                    | Z. Altamimi  |
|                           | <i>Publisher</i>                                 | Institut National de l'Information Géographique et Forestière (IGN), France  |
|                           | <i>Publication date</i>                          | 2018-06-28   |
|                           | <i>Series/Journal name</i>                       | IERS Technical Note  |
|                           | <i>Issue identification</i>                      | 1.0  |
|                           | <i>Title</i>                                     | Report on the Symposium of the IAG Subcommission for the EUREF held in Florence 28 - 31 May 1990                                 |
| <i>Information source</i> | <i>Author</i>                                    | IAG  |
|                           | <i>Publisher</i>                                 | Verlag des Bayerischen Akademie der Wissenschaften   |
|                           | <i>Publication date</i>                          | 1992   |
|                           | <i>Edition date</i>                              |  |
|                           | <i>Series/Journal name</i>                       | IAG Subcommission for the European Reference Frame (EUREF) Publication   |
|                           | <i>Issue identification</i>                      | 1.0  |
|                           | <i>Title</i>                                     | Report on the Symposium of the IAG Subcommission for the EUREF held in Berne 4 - 6 March 1992                                    |
| <i>Information source</i> | <i>Author</i>                                    | IAG  |
|                           | <i>Publisher</i>                                 | Verlag des Bayerischen Akademie der Wissenschaften   |
|                           | <i>Publication date</i>                          | 1992   |
|                           | <i>Edition date</i>                              |  |
|                           | <i>Series/Journal name</i>                       | IAG Subcommission for the European Reference Frame (EUREF) Publication   |
|                           | <i>Issue identification</i>                      | 1.0  |
|                           | <i>Title</i>                                     | ETRS89 realization: Current status, ETRF2005 and Future Development  |
| <i>Information source</i> | <i>Author</i>                                    | Z. Altamimi  |
|                           | <i>Publication date</i>                          | 2008-06-17   |

|                                   |  |
|-----------------------------------|--|
|                                   | <i>Edition date</i>  |
| <i>Data source</i>                | ISO Geodetic Registry  |
| <i>Remarks</i>                    | ETRS89 is the reference system and ETRF89 is its first realization. Unfortunately the two terms have been used synonymously, which has caused some confusion amongst users. The reference frame should be referred to as ETRF89 to distinguish it from other realizations of ETRS89. |
| <i>Anchor definition</i>          | Coincides with ITRF89 at epoch 1989.0 and is fixed to the stable part of the Eurasian tectonic plate through 3 rotation rates derived from the AM02 geophysical model, representing the Eurasian plate's angular velocity about its Euler pole.                                      |
| <i>Release date</i>               | 1990   |
| <i>Coordinate Reference Epoch</i> | 1989.0   |
| <i>Scope</i>                      | Spatial referencing  |
| <i>Ellipsoid</i>                  | GRS 1980   |
| <i>Prime Meridian</i>             | Greenwich  |

## Extent

|                                |   |       |
|--------------------------------|---|-------|
| <i>Description</i>             | <b>Europe - onshore and offshore: Albania, Andorra, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Faroe Islands, Finland, France, Germany, Gibraltar, Greece, Hungary, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Monaco, Montenegro, Netherlands, Norway including Svalbard and Jan Mayen, Poland, Portugal, Romania, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom (UK) including Channel Islands and Isle of Man, Vatican City State.</b> |       |
| <i>Geographic Bounding Box</i> | <i>West-bound longitude</i>   | -16.1 |
|                                | <i>North-bound latitude</i>   | 84.17 |
|                                | <i>East-bound longitude</i>   | 39.65 |
|                                | <i>South-bound latitude</i>   | 32.88 |

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|                             |  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |
|-----------------------------|--|--------------|--------------------------------|---------------|-----------|------------------|--------------------------------------|-------------------------|---------|----------------------------|---------------------|-----------------------------|------------------|-------------|---------|
| <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  |              |                                |               |           |                  |                                      |                         |         |                            |                     |                             |                  |             |         |

# ISO Geodetic Registry

|                            |                               |   |
|----------------------------|-------------------------------|---|
| <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 2D CS. Axes: latitude, longitude. Orientations: north, east. UoM: degree</b>   |   |
| <i>Item status</i>        | VALID   |   |
| <i>Identifier</i>         | 43  |   |
| <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 coordinate reference systems. 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 by the supplier of data. |   |

## 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)                            |