

# ISO Geodetic Registry

|                           |  |  |
|---------------------------|--|--|
| <i>Item class</i>         | GeodeticCRS  |  |
| <i>Name</i>               | <b>ITRF89 - XYZ</b>  |  |
| <i>Item status</i>        | VALID  |  |
| <i>Identifier</i>         | 387  |  |
| <i>Alias</i>              | International Terrestrial Reference Frame 1989   |  |
| <i>Alias</i>              | IERS Terrestrial Reference Frame 1989  |  |
| <i>Information source</i> | <i>Title</i>   | ITRF 89 and other realizations of the IERS Terrestrial Reference System for 1989                 |
|                           | <i>Author</i>  | C. Boucher, Z. Altamimi  |
|                           | <i>Publisher</i>   | Central Bureau of IERS - Observatoire de Paris, 61 avenue de l'Observatoire, 75014 Paris, France |
|                           | <i>Publication date</i>  | 1991-04-01   |
|                           | <i>Edition date</i>  |  |
|                           | <i>Series/Journal name</i>   | IERS Technical Notes   |
|                           | <i>Issue identification</i>  | 6.0  |
| <i>Data source</i>        | ISO Geodetic Registry  |  |
| <i>Remarks</i>            | Replaces ITRF88 - XYZ. Replaced by ITRF90 - XYZ.   |  |
| <i>Scope</i>              | Spatial referencing  |  |
| <i>Datum</i>              | International Terrestrial Reference Frame 1989   |  |
| <i>Coordinate System</i>  | Geocentric 3D right-handed Cartesian CS. Axes: Geocentric X,Y,Z. Orientation: Z to North Pole, [X and Y in the equatorial plane, X at Prime Meridian   X in the equatorial plane at the Prime Meridian]. UoM: m. |  |

## Extent

|                                |                             |        |
|--------------------------------|-----------------------------|--------|
| <i>Description</i>             | <b>World.</b>               |        |
| <i>Geographic Bounding Box</i> | <i>West-bound longitude</i> | -180.0 |
|                                | <i>North-bound latitude</i> | 90.0   |
|                                | <i>East-bound longitude</i> | 180.0  |
|                                | <i>South-bound latitude</i> | -90.0  |

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|                           |   |   |
|---------------------------|---|---|
| <i>Item class</i>         | GeodeticDatum   |   |
| <i>Name</i>               | <b>International Terrestrial Reference Frame 1989</b> |   |
| <i>Item status</i>        | VALID   |   |
| <i>Identifier</i>         | 192   |   |
| <i>Alias</i>              | ITRF 89   |   |
| <i>Alias</i>              | IERS Terrestrial Reference Frame 1989                 |   |
| <i>Alias</i>              | ITRF89  |   |
| <i>Information source</i> | <i>Title</i>  | ITRF 89 and other realizations of the IERS Terrestrial Reference System for 1989  |
|                           | <i>Author</i>   | C. Boucher, Z. Altamimi   |
|                           | <i>Publisher</i>                                      | Central Bureau of IERS - Observatoire de Paris, 61 avenue de l'Observatoire, 75014 Paris, France  |
|                           | <i>Publication date</i>                               | 1991-04-01  |
|                           | <i>Edition date</i>                                   |   |
|                           | <i>Series/Journal name</i>                            | IERS Technical Notes  |
|                           | <i>Issue identification</i>                           | 6.0   |
| <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   |
|                           | <i>ISO Geodetic Registry</i>                          |   |
|                           | <i>Remarks</i>  | Replaces ITRF88. Replaced by ITRF90. This is a purely Cartesian reference frame with no ellipsoid defined. GRS80 is the ellipsoid recommended by the IAG and IERS.  |
|                           | <i>Anchor definition</i>                              | Realisation of the IERS Terrestrial Reference System (ITRS) at reference epoch 1988.0. Origin and scale are defined by an average of selected SLR solutions. Orientation is defined such that no global rotation exists with respect to ITRF88. Time evolution is defined by the AMO-2 plate motion model of Minster and Jordan (1978); no global velocity field was estimated for ITRF88. The AMO-2 model is used to estimate positions at other epochs. Datum defined by a set of 3 dimensional Cartesian station coordinates given by the citations. |
|                           | <i>Release date</i>                                   | 1991-04-01  |
|                           | <i>Coordinate Reference Epoch</i>                     | 1988.0  |
|                           | <i>Scope</i>  | Spatial referencing   |
| <i>Ellipsoid</i>          | GRS 1980  |   |
|                           | Greenwich   |   |

## Extent

|                                |                             |        |
|--------------------------------|-----------------------------|--------|
| <i>Description</i>             | <b>World.</b>               |        |
| <i>Geographic Bounding Box</i> | <i>West-bound longitude</i> | -180.0 |
|                                | <i>North-bound latitude</i> | 90.0   |
|                                | <i>East-bound longitude</i> | 180.0  |
|                                | <i>South-bound latitude</i> | -90.0  |

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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>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>Information source</i>  | <i>Publication date</i>       | 2010  |
|                            | <i>Edition date</i>           |   |
|                            | <i>Series/Journal name</i>    | IERS Technical Notes  |
|                            | <i>Issue identification</i>   | 36.0  |
|                            | <i>Other citation details</i> | ISSN: 1019-4568   |
| <i>Data source</i>         | ISO Geodetic Registry         |   |
| <i>Greenwich longitude</i> | 0.0 °                         |   |

# ISO Geodetic Registry

|                           |   |   |
|---------------------------|---|---|
| <i>Item class</i>         | CartesianCS   |   |
| <i>Name</i>               | <b>Geocentric 3D right-handed Cartesian CS.</b><br><b>Axes: Geocentric X,Y,Z. Orientation: Z to North Pole, [X and Y in the equatorial plane, X at Prime Meridian   X in the equatorial plane at the Prime Meridian]. UoM: m.</b>       |   |
| <i>Item status</i>        | VALID   |   |
| <i>Identifier</i>         | 45  |   |
| <i>Alias</i>              | Earth centred, earth fixed, right-handed 3D coordinate system, consisting of 3 orthogonal axes with X and Y axes in the equatorial plane, positive Z-axis parallel to mean earth rotation axis and pointing towards North Pole. UoM: m. |   |
| <i>Alias</i>              | ECEF  |   |
| <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 geocentric coordinate reference systems.  |   |

## Axes

|                           |                             |   |
|---------------------------|-----------------------------|---|
| <i>Item class</i>         | CoordinateSystemAxis        |   |
| <i>Name</i>               | <b>Geocentric X</b>         |   |
| <i>Item status</i>        | VALID                       |   |
| <i>Identifier</i>         | 33                          |   |
| <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>Abbreviation</i>       | X                           |   |
| <i>Direction</i>          | Geocentre > equator/0°E     |   |
| <i>Unit</i>               | metre                       |   |

  

|                    |                      |  |
|--------------------|----------------------|--|
| <i>Item class</i>  | CoordinateSystemAxis |  |
| <i>Name</i>        | <b>Geocentric Y</b>  |  |
| <i>Item status</i> | VALID                |  |
| <i>Identifier</i>  | 37                   |  |

|                           |                             |   |
|---------------------------|-----------------------------|---|
| <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>Abbreviation</i>       | Y                           |   |
| <i>Direction</i>          | Geocentre > equator/90°E    |   |
| <i>Unit</i>               | metre                       |   |

|                           |                             |   |
|---------------------------|-----------------------------|---|
| <i>Item class</i>         | CoordinateSystemAxis        |   |
| <i>Name</i>               | <b>Geocentric Z</b>         |   |
| <i>Item status</i>        | VALID                       |   |
| <i>Identifier</i>         | 39                          |   |
| <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>Abbreviation</i>       | Z                           |   |
| <i>Direction</i>          | Geocentre > north pole      |   |
| <i>Unit</i>               | metre                       |   |