

# ISO Geodetic Registry

|                           |  |   |
|---------------------------|--|---|
| <i>Item class</i>         | GeodeticCRS  |   |
| <i>Name</i>               | <b>NAD 83 (MA11) Epoch 2010 - LatLonEht</b>  |   |
| <i>Item status</i>        | VALID  |   |
| <i>Identifier</i>         | 231  |   |
| <i>Alias</i>              | NAD83(MA11)  |   |
| <i>Alias</i>              | North American Datum of 1983 (MA11)  |   |
| <i>Information source</i> | <i>Title</i>   | Notice to Adopt Standard Method for Horizontal Datum Transformation   |
|                           | <i>Author</i>  | US Government   |
|                           | <i>Publisher</i>   | Office of Federal Register, NARA  |
|                           | <i>Publication date</i>  | 1990-08-10  |
|                           | <i>Edition date</i>  | 1990-08-10  |
|                           | <i>Series/Journal name</i>   | Federal Register Notice   |
|                           | <i>Issue identification</i>  | Volume 55, No. 155, Document: 00-18809  |
|                           | <i>Page</i>  | 32681.0   |
|                           | <i>Other citation details</i>  | Mandates use of NADCON for official transformations between datums  |
|                           | <i>Title</i>   | Publication of North American Datum of 1983 (2011) Epoch 2010.00, North American Datum of 1983 (PA2011) Epoch 2010.00 and North American Datum of 1983 (MA2011) Epoch 2010.00 |
| <i>Information source</i> | <i>Author</i>  | US Government   |
|                           | <i>Publisher</i>   | Office of Federal Register, NARA  |
|                           | <i>Publication date</i>  | 2013-08-08  |
|                           | <i>Edition date</i>  | 2013-08-08  |
|                           | <i>Series/Journal name</i>   | Federal Register Notice   |
|                           | <i>Issue identification</i>  | Volume 78, No. 153, Document: 2013–19167, Citation: 78 FR 48421   |
|                           | <i>Page</i>  | 48421-48422   |
|                           | <i>Title</i>   | NADCON 5.0: Geometric Transformation Tool for points in the National Spatial Reference System   |
|                           | <i>Author</i>  | D. Smith, A. Bilich   |
|                           | <i>Publisher</i>   | NOAA's National Geodetic Survey   |
| <i>Information source</i> | <i>Publication date</i>  | 2017-03-27  |
|                           | <i>Edition date</i>  | 2017-03-27  |
|                           | <i>Series/Journal name</i>   | NGS Technical Report  |
|                           | <i>Other citation details</i>  | Replaces version 4.2 and all earlier. Provides gridding algorithm, datum transformations, and extents of covnversion grids.   |
|                           | <i>Title</i>   | CORS Coordinates  |
|                           | <i>Author</i>  | National Geodetic Survey  |
|                           | <i>Publisher</i>   | National Oceanic and Atmospheric Administration (NOAA) National Geodetic Survey (NGS)   |
|                           | <i>Revision date</i>   | 2017-05-16  |
|                           | <i>Series/Journal name</i>   | NGS Online listing of transformation parameters   |
|                           | <i>Other citation details</i>  | webpage   |
| <i>Data source</i>        | ISO Geodetic Registry  |   |
| <i>Scope</i>              | Spatial referencing  |   |
| <i>Datum</i>              | North American Datum of 1983 (MA11) Epoch 2010   |   |
| <i>Coordinate System</i>  | Ellipsoidal 3D CS. Axes: latitude, longitude, ellipsoidal height. Orientations: north, east, up. UoM: degree, degree, metre. |   |

Extent

|                                |  |  |        |
|--------------------------------|--|--|--------|
| <i>Description</i>             | <b>Guam - onshore and offshore. Northern Mariana Islands - onshore and offshore. Palau - onshore and offshore.</b> |  |        |
| <i>Geographic Bounding Box</i> | <i>West-bound longitude</i>  |  | 129.48 |
|                                | <i>North-bound latitude</i>  |  | 23.9   |
|                                | <i>East-bound longitude</i>  |  | 149.55 |
|                                | <i>South-bound latitude</i>  |  | 1.64   |

# ISO Geodetic Registry

|                           |  |   |
|---------------------------|--|---|
| <i>Item class</i>         | GeodeticDatum  |   |
| <i>Name</i>               | <b>North American Datum of 1983 (MA11) Epoch 2010</b>  |   |
| <i>Item status</i>        | VALID  |   |
| <i>Identifier</i>         | 101  |   |
| <i>Alias</i>              | NAD83(MA11)  |   |
| <i>Information source</i> | <i>Title</i>   | Notice to Adopt Standard Method for Horizontal Datum Transformation   |
|                           | <i>Author</i>  | US Government   |
|                           | <i>Publisher</i>   | Office of Federal Register, NARA  |
|                           | <i>Publication date</i>  | 1990-08-10  |
|                           | <i>Edition date</i>  | 1990-08-10  |
|                           | <i>Series/Journal name</i>   | Federal Register Notice   |
|                           | <i>Issue identification</i>  | Volume 55, No. 155, Document: 00-18809  |
|                           | <i>Page</i>  | 32681.0   |
|                           | <i>Other citation details</i>  | Mandates use of NADCON for official transformations between datums  |
|                           | <i>Information source</i>  |   |
|                           | <i>Title</i>   | CORS Coordinates  |
|                           | <i>Author</i>  | National Geodetic Survey  |
|                           | <i>Publisher</i>   | National Oceanic and Atmospheric Administration (NOAA) National Geodetic Survey (NGS)   |
|                           | <i>Revision date</i>   | 2017-05-16  |
|                           | <i>Series/Journal name</i>   | NGS Online listing of transformation parameters   |
| <i>Information source</i> | <i>Other citation details</i>  | webpage   |
|                           | <i>Title</i>   | NADCON 5.0: Geometric Transformation Tool for points in the National Spatial Reference System   |
|                           | <i>Author</i>  | D. Smith, A. Bilich   |
|                           | <i>Publisher</i>   | NOAA's National Geodetic Survey   |
|                           | <i>Publication date</i>  | 2017-03-27  |
|                           | <i>Edition date</i>  | 2017-03-27  |
|                           | <i>Series/Journal name</i>   | NGS Technical Report  |
| <i>Information source</i> | <i>Other citation details</i>  | Replaces version 4.2 and all earlier. Provides gridding algorithm, datum transformations, and extents of covnversion grids.   |
|                           | <i>Title</i>   | Publication of North American Datum of 1983 (2011) Epoch 2010.00, North American Datum of 1983 (PA2011) Epoch 2010.00 and North American Datum of 1983 (MA2011) Epoch 2010.00 |
|                           | <i>Author</i>  | US Government   |
|                           | <i>Publisher</i>   | Office of Federal Register, NARA  |
|                           | <i>Publication date</i>  | 2013-08-08  |
|                           | <i>Edition date</i>  | 2013-08-08  |
|                           | <i>Series/Journal name</i>   | Federal Register Notice   |
|                           | <i>Issue identification</i>  | Volume 78, No. 153, Document: 2013–19167, Citation: 78 FR 48421   |
|                           | <i>Page</i>  | 48421-48422   |
|                           | <i>Data source</i>   | ISO Geodetic Registry   |
| <i>Remarks</i>            | Replaces NAD83(MARP00) for control determined in an active reference frame and NAD83 (FBN) for passive control.  |   |
| <i>Anchor definition</i>  | Realization of NAD83. The frame is defined by a seven parameter transformation of ITRF2008 3D geocentric Cartesian coordinates and velocities for the Guam and the Commonwealth of the Northern Mariana Islands (CNMI) at reference epoch 2010.0. The frame is kept aligned to the Mariana tectonic plate using an Euler pole rotation. The origin, scale and orientation of the frame are nominally defined |   |

|                                   |   |
|-----------------------------------|---|
|                                   | to be that for the BIH Terrestrial System 1984 (BTS84). This also is a realization of passive control constrained to the values at the CORS. NAD83(2011) serves as a connection between passive network transformed by grids and active frames defined by time-dependent transformations. |
| <i>Release date</i>               | 2013  |
| <i>Coordinate Reference Epoch</i> | 2010.0  |
| <i>Scope</i>                      | Spatial referencing   |
| <i>Ellipsoid</i>                  | GRS 1980  |
| <i>Prime Meridian</i>             | Greenwich   |

## Extent

|                                |  |        |
|--------------------------------|--|--------|
| <i>Description</i>             | <b>Guam - onshore and offshore. Northern Mariana Islands - onshore and offshore. Palau - onshore and offshore.</b> |        |
| <i>Geographic Bounding Box</i> | <i>West-bound longitude</i>  | 129.48 |
|                                | <i>North-bound latitude</i>  | 23.9   |
|                                | <i>East-bound longitude</i>  | 149.55 |
|                                | <i>South-bound latitude</i>  | 1.64   |

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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 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  |
|                           | ISO Geodetic Registry  |   |
| <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  |   |