# ISO Geodetic Registry

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|---|---|---|
| *Item class* | Transformation | |
| *Name* | **NAD27 to NAD 83 (1986) [USA v1]** | |
| *Item status* | VALID | |
| *Identifier* | 551 | |
| *Information source* | *Title* | NADCON 5.0: Geometric Transformation Tool for points in the National Spatial Reference System |
| | *Author* | D. Smith, A. Bilich |
| | *Publisher* | NOAA's National Geodetic Survey |
| | *Publication date* | 2017-03-27 |
| | *Edition date* | 2017-03-27 |
| | *Series/Journal name* | NGS Technical Report |
| | *Other citation details* | Replaces version 4.2 and all earlier. Provides gridding algorithm, datum transformations, and extents of covnversion grids. |
| *Information source* | *Title* | Notice to Adopt Standard Method for Horizontal Datum Transformation |
| | *Author* | US Government |
| | *Publisher* | Office of Federal Register, NARA |
| | *Publication date* | 1990-08-10 |
| | *Edition date* | 1990-08-10 |
| | *Series/Journal name* | Federal Register Notice |
| | *Issue identification* | Volume 55, No. 155, Document: 00-18809 |
| | *Page* | 32681.0 |
| | *Other citation details* | Mandates use of NADCON for official transformations between datums |
| *Data source* | ISO Geodetic Registry | |
| *Remarks* | Grid Transformation | |
| *Operation version* | USA v1 | |
| *Scope* | Spatial referencing | |
| *Operation accuracy* | 0.15 m | |
| *Source CRS* | NAD27 - LatLon | |
| *Target CRS* | NAD 83 (1986) - LatLon | |
| *Operation method* | NADCON 5 (2D) | |

## Extent

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|---|---|
| *Description* | **United States (USA) - onshore and offshore - CONUS (Alabama, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming).** |

| | | |
|---|---|---|
| *Geographic Bounding Box* | *West-bound longitude* | -135.0 |
| | *North-bound latitude* | 50.0 |
| | *East-bound longitude* | -66.0 |
| | *South-bound latitude* | 24.0 |

## Operation parameter values

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|---|---|
| *Latitude difference file* | nadcon5.nad27.nad83_1986.conus.lat.trn.20160901.b |
| *Longitude difference file* | nadcon5.nad27.nad83_1986.conus.lon.trn.20160901.b |

# ISO Geodetic Registry

| | |
|---|---|
| *Item class* | OperationMethod |
| *Name* | **NADCON 5 (2D)** |
| *Item status* | VALID |
| *Identifier* | 73 |
| *Alias* | NADCON |
| *Alias* | NADCON 5 |
| *Data source* | ISO Geodetic Registry |
| *Remarks* | The latitude and longitude offsets at a point are derived by interpolation within the gridded data. Separate grid files are given for latitude and longitude offsets. The grid file format is given in documentation available from the information source. Biquadratic interpolation is used to derive the offset values. For the forward calculation the interpolated value of the offset is then added to the source CRS coordinate value to give the coordinates in the target CRS. Transformations between NAD27 and NAD83(1986) and between NAD83(1986) and NAD83(HARN) are only two dimensional (latitude and longitude) as those CRS are ONLY defined in two dimensions. Hence, this operational method is used to make those transformations. Later realizations of NAD83(HARN) included heights and use the other operational method. NADCON includes all versions from 1 through 5 (released in 2017). While the first and the last used slightly different grids and interpolation methods, the differences are deemed to be within the errors of the methods and considered equivalent. Hence users of NADCON 2.1 should generate equivalent results for transformations using NADCON 5.0. Note that this operational method is for 2D transformation (latitude and longitude only). Another method uses only a 3D transformation. Reversibility: Iteration is required for the reverse transformation. The coordinate reference system for the coordinates of the grid nodes is the source coordinate reference system for the forward transformation. Then in forward transformations the offset is obtained through straightforward interpolation of the grid file. But for the reverse transformation the first grid interpolation entry will be the value of the point in the second coordinate reference system, the offsets are interpolated and applied with sign reversed, and the result used in further iterations of interpolation and application of offset until the difference between results from successive iterations is insignificant. |