ISO Geodetic Registry

Item class	Transformation	
Name	**NAD 83 (1986) to NAD 83 (HARN) [v1]**	
Item status	VALID	
Identifier	498	
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	v1	
Scope	Spatial referencing	
Operation accuracy	0.05 m	
Source CRS	NAD 83 (1986) - LatLon	
Target CRS	NAD 83 (HARN) - LatLon	
Operation method	NADCON 5 (2D)	

Extent

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

Latitude difference file	nadcon5.nad83_1986.nad83_harn.conus.lat.trn.20160901.b
Longitude difference file	nadcon5.nad83_1986.nad83_harn.conus.lon.trn.20160901.b

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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.