

Coming  
in 2022:

**New  
Datums!**

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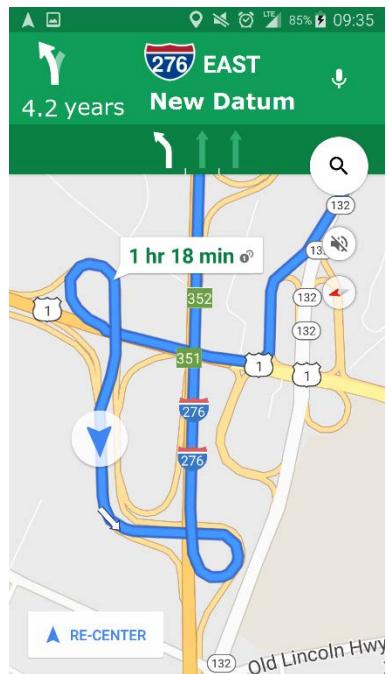
## Roadmap to the new Datums of 2022

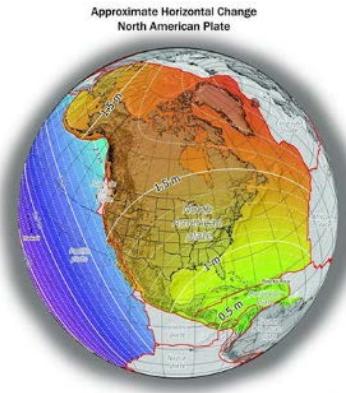
February 2018 Article

By: Brian Fisher

Several things are going on at the National Geodetic Survey (NGS), most notably the current datums: North American Datum of 1983 (NAD83) and North American Vertical Datum of 1988 (NAVD88) are scheduled to be replaced with [new datums](#), North American Terrestrial Reference Frame of 2022 (NATRF2022) and North American-Pacific Geopotential Datum of 2022 (NAPGD2022). This article will outline several of the steps to get to the new reference frame and vertical datum and how we at the local level in Arizona can be involved to influence the products we receive back from NGS. According to the current schedule, this is all happening only about four years from now. These changes can be categorized into the activities that will happen before the new datums are released, and changes caused when the new datums comes out. Lead up activities will include: the final geoid model used with the current vertical datum (GEOID18); redefinition of the State Plane Coordinate (SPC) system (low distortion projection 'LDP' design methods will be an option); reinvention of the interface between NGS and how people will submit data to them (OPUS-Share, OP2IDB, DSWorld). Things that will occur with the release of the new datum will include: an entirely new vertical datum (NAPGD2022); updated coordinates for all modern survey control marks (NATRF2022) including CORS, OPUS-Share and passive marks with post 1997 GPS observations; new transformation tools to facilitate working with legacy data ([NCAT](#)).

Who will this effect? Short answer is all of us, but some more than others. Agencies, typically federal, governed by OMB Circular A-16 will be mandated to produce their new spatial data products in the new datums when they are released by NGS. Users of this data will also be effected because the data they receive from these agencies will be on the new systems. Any user of NGS products will be transitioned to use the new datums also. This will include the position published on data sheets and the position computed when using OPUS (RS, Static, Share, Projects, etc.). Users of CORS will also be effected as the CORS will be positioned in the new reference system.





How big is the change? NATRF2022 will differ from NAD83 by about five feet in Arizona. Most of this is in the horizontal but there will be about two and a half feet in the ellipsoid height. This differs greatly from the NAD83 adjustments we have seen in the last three decades. Previous NAD83 adjustments have been at the sub-foot level, in numerical difference (e.g. NAD83(92) or HARN, NAD83(CORS96/2007), NAD83(2011:2010), and for many users this sub-foot difference is nearly invisible. The 2022 reference system redefinition will be huge in comparison and most all of the professional level data users will need to take notice.

How can we as a State get ready for the new datums? There are several ways to both be involved and to prepare. NGS will be producing products with the data they have, irrespective of what we do on a local level. If NGS has a small amount of data in a region, the quality of the products in that region will not be as good as in regions with more data. NGS is distributing lists of data that is being requested to improve the products NGS is working on preparing. First up is a [GPS on Benchmark](#) campaign going on now and ending in August 2018.

NGS is giving us as a State the opportunity to contribute data and designs back to them so that NGS can help us. The relationship between NGS and the States is very similar to the relationship between a manager, supervisor and the worker. The manager and supervisor typically do not perform 'the work', they just make sure the worker has everything they need to get 'the work' done. In this analogy, NGS is the manager of geodetic data. The supervisor is much like the position of an NGS regional advisor and state coordinator, where the workers are the rest of us, a mixture of Federal, State, County, City and private surveyors. 'The work' is listed in the next paragraph.

Field observations can be made and submitted to improve both GEOID18 and NCAT transformation tools. Work groups of stakeholders can meet at the state level and directly influence the SPC coordinate systems being designed for 2022. Later this year articles about these projects will be published and your involvement will be requested. At any time you can contact your NGS representatives for more information.

For more information about the 2022 Datums visit  
<https://geodesy.noaa.gov/datums/newdatums/index.shtml>

or contact your State Geodetic Coordinator, Brian Fisher [GeodesyArizona@gmail.com](mailto:GeodesyArizona@gmail.com)