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Washington State Reference Network

A Regional Cooperative of Real-Time GPS Networks

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Please forward this memo to your organization's GPS field users/managers. The following outlines a change to the reference framework that may impact their field operations.

Updated Realization of NAD83-2011 Coordinates

Summary: The "Mini-Shift"

In 2025, the National Geodetic Survey updated the NAD83-2011 Epoch 2010.00 coordinates for all NGS CORS. This came about from a new multi-year CORS solution: https://geodesy.noaa.gov/CORS/news/mycs3/mycs3.shtml

As the WSRN constrains all reference stations to current realizations of the National Spatial Reference System (NSRS), the WSRN will also implement this update.

As the NATRF2022 datum shift has been delayed several years, this interim "shift" is important, to account for plate velocities, and to take advantage of the improved data as utilized in MYCS3.

Note that this is not a "new datum", but more of a new realization of the same NAD83-2011 Epoch 2010.00 of the NSRS.

Coordinate changes have been ongoing, to keep up with the dynamic earth. The WSRN has always updated coordinates for reference stations that drift out of acceptable tolerances, due to plate velocities. Typically, this occurs for stations on the coast (where velocities are higher than inland). For example, a reference station on the coast may be updated as needed, typically yearly, whereas a reference station in Eastern WA might only need to be updated every 8 years or so.

Also note that the NGS updates CORS coordinates if currently realized coordinates differ from published coordinates outside of acceptable tolerances. In this case though, they have updated all NGS CORS coordinates, all at the same time.

Changes are often subtle, and users may not notice any differences. Users in coastal areas are used to such incremental changes and employ best practices for perpetuating long-term project control accordingly. For instance, by localizing to previously established project control.

What is a Multi-year CORS solution?

When the NGS executes a MYCS, it uses a minimum of 2.5 years of CORS data to compute new coordinates for the antenna reference point (ARP) of a CORS. More on this at: *https://geodesy.noaa.gov/CORS/news/mycs3/mycs3.shtml.* There was an MYCS1, then MYCS2 (in early 2012, when the NAD83-CORS96 to NAD83-2011 update was implemented).

MYCS3 values were published for NGS CORS in April-June of 2025. The WSRN applied these new coordinates on included NGS CORS in June of 2025.

The adoption of MYCS3 coordinates by the NGS, on all of the CORS presented a conundrum. For example, if an OPUS user submitted observations a year ago, they will get slightly different results than if they submit observations now. The datasheets for NGS CORS reflect the new values. However, Bluebooked positions (for WSRN stations) do not yet reflect MYCS3. To stay consistent with the NGS CORS, the WSRN must update all non-CORS reference station coordinates (more on this later).

What is the WSRN Approach to MYCS3?

On a development server, the WSRN imported the new MYCS3 CORS values, supplied by the NGS. Then, we constrained all non-CORS reference stations to the new NGS CORS coordinates. The WSRN applied multiple geodetic computation methods to generate MYCS3 coordinates for the ARP of all WSRN reference stations.

We then asked users in different regions of WA to do some test shots on published marks, or to set new test marks. They completed observations for VRS and single-base using the existing production caster (MYCS2) and the development caster (MYCS3). The results were consistent with estimated differences for each region.

We also note that application of MYCS3 showed improved relative spatial relationships across the network. More data yielded an improved reference framework realization.

The WSRN will update the coordinates for the existing production casters on January 19 of 2026.

How Much Difference?

Typically, across the state, the differences between MYCS2 and MYCS3 coordinates is less than 0.10' (3D). We have developed a table of expected differences for different parts of the state (see attachment). For example, in the vicinity of Spokane (based on computations for station "SPKN", and confirmed by local testing), you might see differences of:

N Δ ft	E Δ ft	Ellip Δ ft	2D Δ ft	3D Δ ft
0.06	0.03	0.01	0.06	0.06

You can preview expected differences by looking at:

www.wsrn3.org/CONTENT/Reference/MYCS2_MYCS3_Differences.pdf or

www.wsrn.org/CONTENT/Reference/MYCS2_MYCS3_Differences.pdf

We organized these reports by subnet, with expected differences in the vicinity of NGS CORS and all WSRN stations.

Recommendations for Field Users

Users may not see any significant differences. However, it is recommended that you do some checks to see if/how much change there might be for your existing project control.

- Review the attached estimated difference lists for the nearest location to your project or projects. Estimated differences across the state range from 0.03' (3D) to 0.10' (3D).
- Once the new values have been applied by the WSRN on the date previously noted, revisit legacy project control, and do a few test observations.
- If the differences are significant enough, but you would prefer to continue working with the coordinates of existing project control, you can localize (in your field software) to legacy values (at the project level).

Users can still use the same standard NAD83-2011 SPC projections, and current Geoid models. There are no changes to WSRN subnets, real-time services, or static files (for post-processing). These changes are limited to the ARP coordinates for each reference station, and this is reflected in any downloadable reference framework materials on the WSRN websites:

www.wsrn.org/Geodesy.aspx and www.wsrn3.org/Geodesy.aspx

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Looking Ahead to the NATRF2022 Datum Shift

As noted, the National Geodetic Survey has delayed, by several years, the major datum update (to NATRF2022 and NAPGD2022) by several years. This mini-shift serves to keep reference coordinates up-to-date in the interim. There is no firm timeline for the big shift yet. Likely in late 20206 or early 2027. You could think of this mini-shift as a dress rehearsal for the pending big shift.

Once the NGS provides a date, in advance, for the adoption of NATRF2022 and NAPGD2022, the WSRN will notify users of an adoption date (likely the same date).

On the “big shift” day, the WSRN will launch dual casters; one for each datum. For NATRF2022, users will choose the same NTRIP casters they have always used, but with a new port of “2022”. Beginning on the same day, and for an 18-month transition period, to access NAD83-2011 (MYCS3), users will need to use a new port on the same casters “2011”. The old “8080” port will be retired at that time.

While the dual reference framework 18-month transition will be available for the entire network, it is recommended that users of the PACWA subnet transition within 6 months of the “big shift” date, users of the SWWA, PRSN, and NWWA subnets transition within a year, whereas users of the EWA and SEWA subnets could go the whole 18 months.

If you have any questions, please contact us.