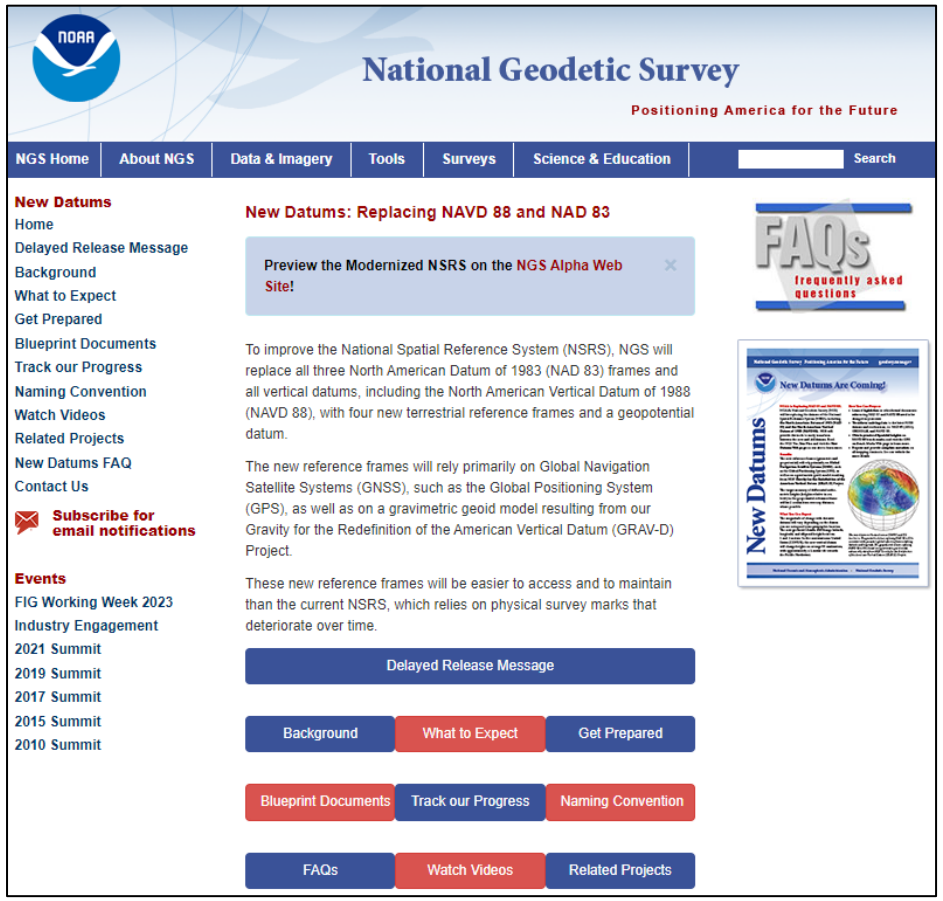
Washington State Reference Network

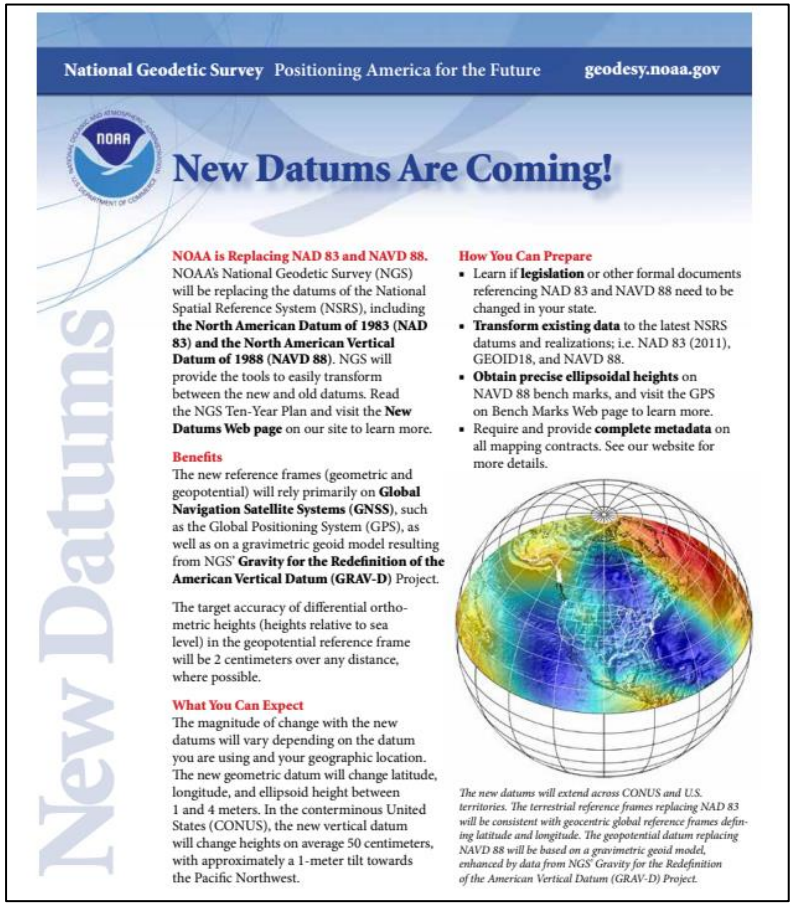
Datum Transition Plan

Planning for the Datum Change

Check this Website for Updates!

geodesy.noaa.gov/datums/newdatums/index.shtml





The WSRN will be transitioning to the new Reference Framework when the National Geodetic Survey officially adopts it.

Users will be notified 3-6 months in advance…

For a transition period of 6-18 months after adoption, WSRN users will be able to access both Reference Frameworks for all services.

Details outlined in the following pages…

WSRN Plans for the Datum Transition

Key Things to Keep in Mind:

- The reference framework for the WSRN is simply the NGS defined NSRS (not SPC)
- 2022 will be implemented by the WSRN when the shift happens. Primary mountpoints will reflect this change.
- Alternate mountpoints for NAD83-2011 Epoch2010.00 will be available for 18 months. However, there are recommendations for transitioning for each state region.
- Projections (i.e., State Plane Zones, LDP, UTM) are applied in your field or office software.
- Projections are NOT reflected in WSRN outputs (there is no mechanism to do that).
- The WSRN is not a help desk for projection settings (consult with your hardware/software vendors).

WA and the New Datum

RCW 58.20.165 Geodetic datums. The official geodetic datums to which geodetic coordinates including, but not limited to, latitude, longitude, ellipsoid height, orthometric height, or dynamic height are referenced within the state of Washington must be as defined for the NSRS. [2020 c 50 s 6.]

RCW 58.20.185 Standard value—One foot. When the values are expressed in feet, one foot equals 0.3048 meters, must be used as the standard foot for WPCS. [2020 c 50 s 8.]

International foot baked into the new datum and projections

RCW 58.20.200 Term—Limited use. The use of the term "Washington plane coordinate system" on any map, report of survey, or other document, shall be limited to coordinates based on the Washington plane coordinate system as defined in this chapter. [2020 c 50 s 9; 1989 c 54 s 18.]

Planning for the Datum Change

NGS Reference Framework Change:

- **Likely this will happen in early-mid 2026** (The National Geodetic Survey has not yet announced a firm launch date)

- It will be developed as a 2022 realization. New horizontal and geopotential realization: **NATRF2022** (Horizontal) **and NAPGD2022** (Vertical). Plus, a new geoid: GEOID2022.

- This is based on an ellipsoid more coincident with earth-centered-earth-fixed (ECEF) global ellipsoids (e.g., IGS, ITRF, WGS) and not NAD83 (there was 2m offset between the two at the earth's center).

- NGS will develop new projections (e.g., north zone, south zone, single-statewide, etc.) Plus, new (optional) Low Distortion Projections (if WA develops LDPs to submit to the NGS).

- Manufacturers will add 2022 and corresponding projections to field and office software.

- NGS will publish new coords for NGS CORS (likely in both datums, for a transition period).

- WSDOT tentatively plans to publish 2022 values as well.

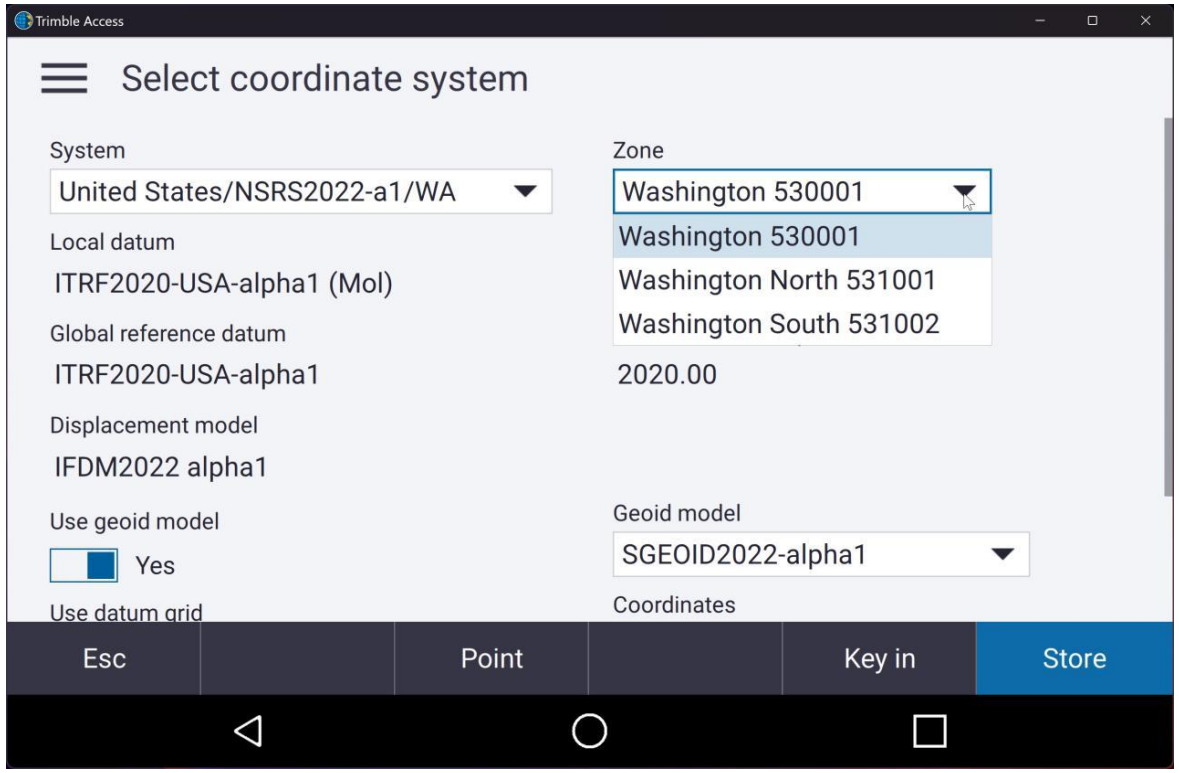
New State Plane Projections

There NGS is releasing new state plane projections:

- WA North Zone Intl-ft 531001
- WA South Zone Intl-ft 531002
- WA Statewide Intl-ft 530001

Low Distortion Zones are in development (These will not replace the 3 zones)

Manufacturers are already beginning to add the new zones to projection libraries in field and office software.



WSRN Datum Transition Plan

Prior to transition:

Use the same caster I.P.s and ports as you currently use:

www.wsrn.org = 156.74.250.121
www.wsrn3.org = 156.74.250.108

Port 8080 = NAD83-2011 Epoch 2010.00

WSRN Dual Datum Transition Plan

Once the new datum launches:

www.wsrn.org = 156.74.250.121
www.wsrn3.org = 156.74.250.108

Choose a datum by selecting the corresponding port:

Port 2022 = 2022

Port 2011 = NAD83-2011 Epoch 2010.00

Port 8080 will be retired when the new datum launches

WSRN Plans for the Datum Transition

Static Files:

- Static files will continue to be made available via the Reference Data Shop on both WSRN websites (60-day retention)
- Long term archive (forever) of static files will continue via the CWU/Panga site
- Virtual Rinex will only be retained for 3 days

Online Post- Processing (WAPUS):

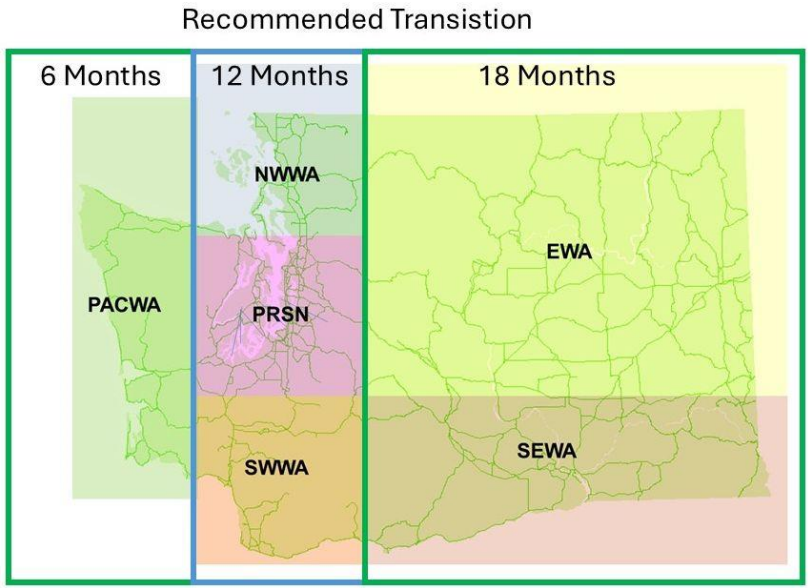
- The WAPUS service on both websites will default to 2022 on the day of the launch
- A legacy WAPUS for NAD83-2011 is being explored for the transition period

Sitelogs, CSV and KML:

- 2022 sitelogs, CSV, and KMLs will be posted on the websites 3-6 months before the launch
- The final iteration of legacy NAD83-2011 sitelogs, CSV and KMLs will be posted on the websites but will no longer be updated after the 2022 launch

Timeline for WSRN Datum Transition

- WSRN will complete Bluebooking of all stations by the end of 2025
- When the NATRF2022/ITRF2020 positions are released, the WSRN will apply these to a development server and confirm the positions we will apply before the transition
- **6 Months before the launch**, all users will be notified of the launch date and caster port changes
- **One month before transition**, the caster port 2011 will be opened to users
- **On the launch date**, the WSRN will apply the new positions (overnight) and set the reference frame to -200. NAD83-2011 will continue to run on the development server. Caster port 2022 will deliver -2022, and caster port 2011 will deliver NAD83-2011. Port 8080 will be retired.
- 6 Months after the launch, NAD83-2011 for the PACWA subnet no longer recommended (due to plate velocity).
- **12 Months after the launch**, NAD83-2011 for subnets PACWA, NWWA, PRSN, SWWA no longer recommended (due to velocity)
- **18 months after the launch**, NAD83-2011 for all subnets no longer supported (due to plate velocity).



WSRN Security Updates

- Not directly related to the datum transition
- Long overdue
- Standard, and required by any IT
- Fully tested on dev servers before deployment
- 3-6 months notice before implementation (likely in 2026)
- Will be transparent to the user, but may require an extra initial step

1. **WSRN websites will transition from HTTP to HTTPS. Users may be asked to accept certificates.**
2. **NTRIP casters will also transition. Users may be asked to accept certificates. URLs must be used instead of numeric I.P. addresses**

WSRN Security Updates

To prepare for the eventual NTRIP change, users are urged to get used to entering the URLs instead of numeric I.P. addresses:

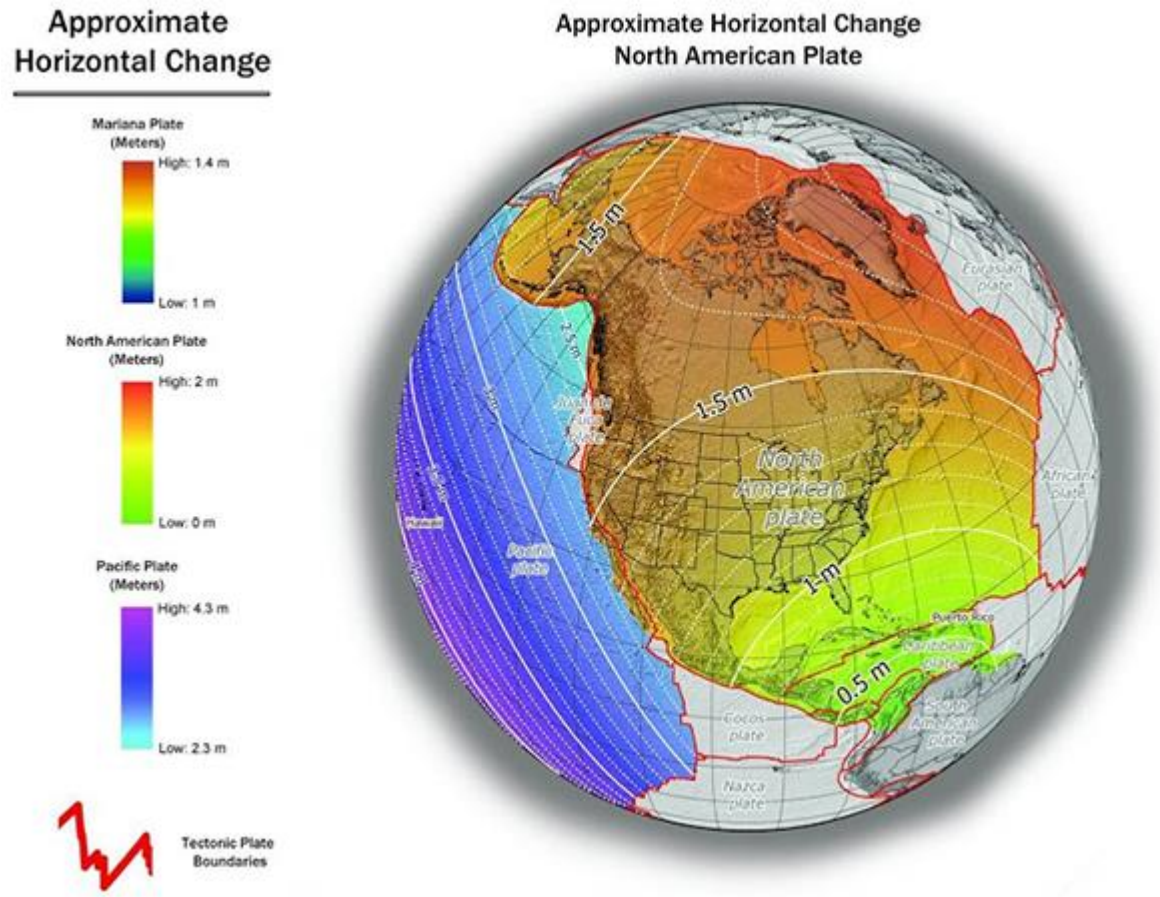
Caster “121” = www.wsrn.org = 156.74.250.121

Caster “108” = www.wsrn.org = 156.74.250.108

Please try the URL, if it does not work, let us know and use the I.P. while we contact your vendor for a fix.

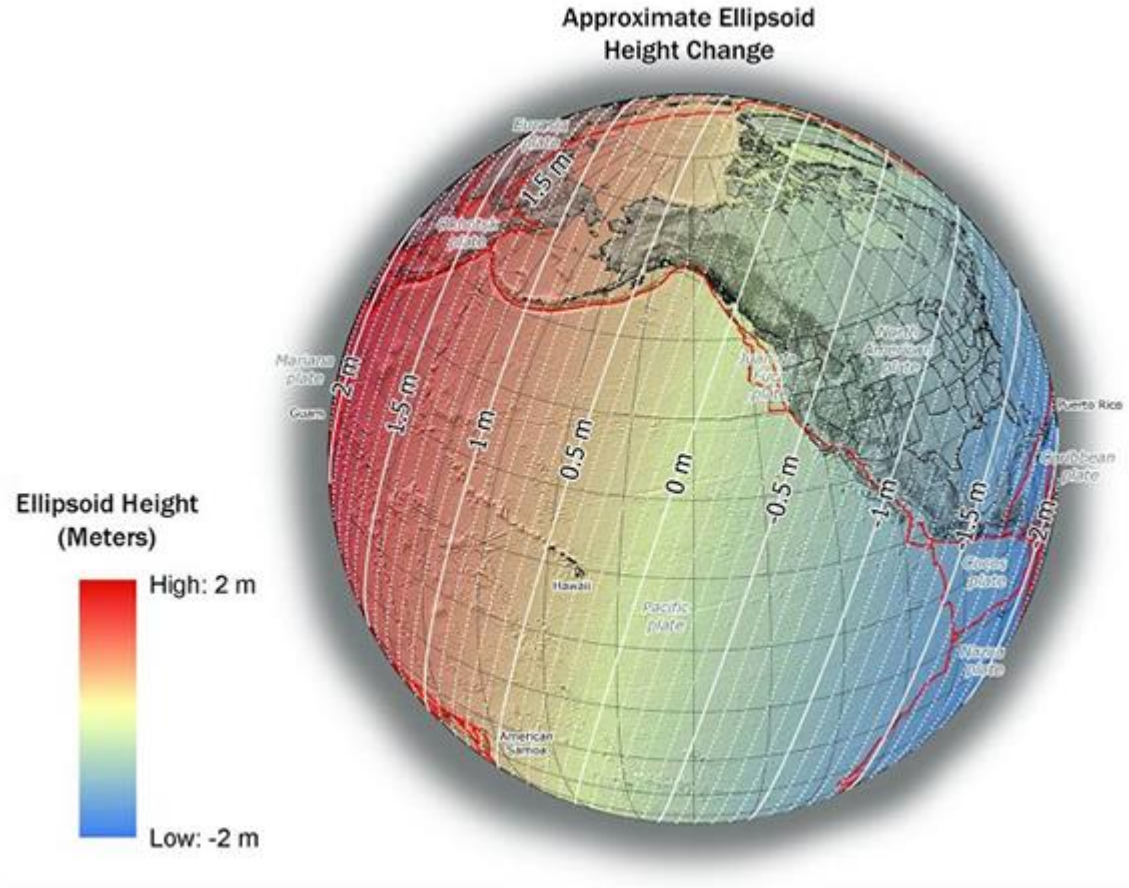
Planning for the Datum Change

How Much of a horizontal shift will you see?
About 4’-4.5’ average in WA



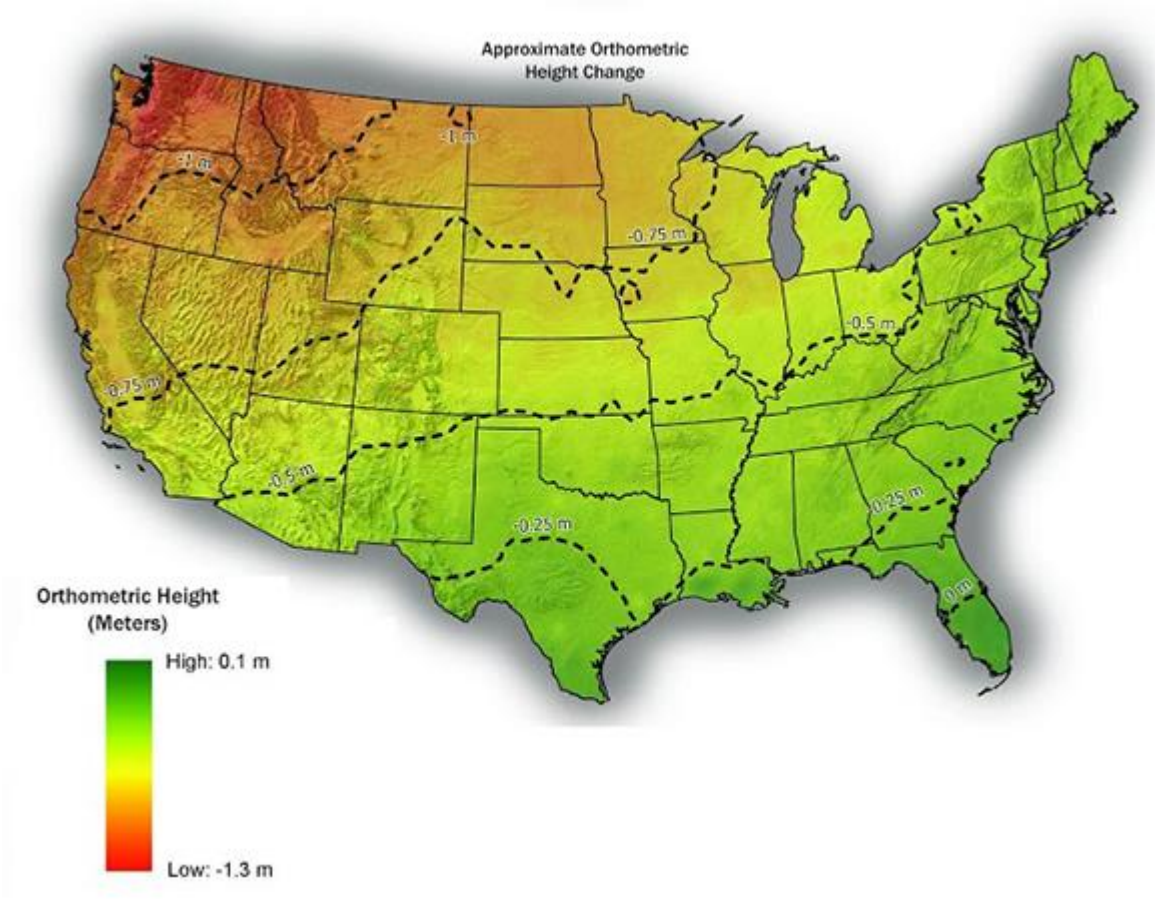
Planning for the Datum Change

How Much of an ellipsoid shift will you see?
About a foot average in WA



Planning for the Datum Change

How Much of an orthometric height shift will you see?
About 3.5’ average in WA. Similar (but not related to) the legacy NGVD29-NAVD88 shift.



Planning for the Datum Change

User Transition Approaches:

- No change, keep using the legacy projections*
- All new projects start in NATRF2022
- Localize/calibrate to keep legacy projects working in NAD83-2011
- Use NGS NCAT, or other time dependent projection tools to keep legacy projects working in NAD83-2011

The WSRN does not endorse any specific approach. Check with your company, clients, contracts, and any state and local policies (if applicable) concerning datum requirements.

*If you use the network for corrections, you will need to localize/calibrate to use the legacy projections

Planning Suggestions for the Datum Change

Establish a Local Test Point :

- Find an NGS and/or WSDOT point near your office. Do static observations and submit to OPUS and WAPUS. Compare your processed values with published. Decide which to use as check point values to compare the difference between datums.

- Set a point at or near your office. Do static observations and submit to OPUS and WAPUS.

- Reobserve your checkpoint after the datum shift. Compare values to the pre-shift and/or new published values.

- You will have a check point with dual values for each datum. Also handy for making sure you choose the appropriate caster port and if rover settings are good.

Planning Suggestions for the Datum Change

Look at NGS Published Datasheets:

- Look at the datasheet for an NGS CORS near you
- These should (as we get closer to the datum change) have 2022 values and NAD83-2011.
- The respective values can give you a generalized idea of what differences to expect in the are of the CORS. Looking at CORS over a wide area can help you develop some rules-of-thumb when looking at observed positions to se if “something seems not quite right”.

Questions?

Check the NGS Datums page: www.geodesy.noaa.gov/datums/newdatums/index.shtml

Check the WSRN FAQ: www.wsrn.org/WSRN_FAQ.pdf

Subscribe to the WSRN Update memos email list: sign-up form

Contact the WSRN: www.wsrn.org/contact.aspx