Washington State Reference Network

Datum Transition Plan

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 12-18 months after adoption, WSRN users will be able to access both Reference Frameworks for all services.

Details outlined in the following pages…

Planning for the Datum Change

NGS Reference Framework Change:

- **Likely this will happen in early 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: **NATREF2022** 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 NATREF2022 and corresponding projections to field and office software.

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

- WSDOT tentatively plans to publish NATREF2022 values as well.

Planning for the Datum Change

Check this Website for Updates!

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

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)

- NATREF2022 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 <mark>12-18 months.</mark>

- Projections (i.e., State Plane Zones, LDP, UTM) are <mark>applied in your field or office software</mark>.

- 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).

Current WSRN Redundant Systems
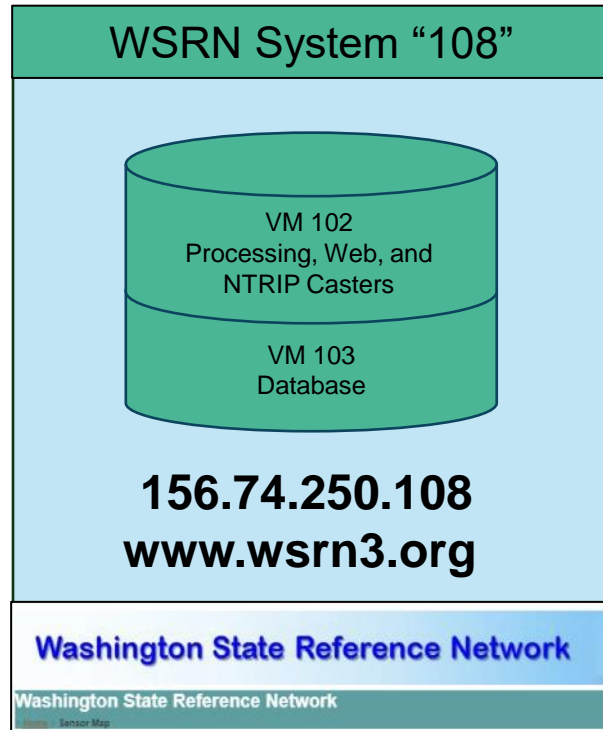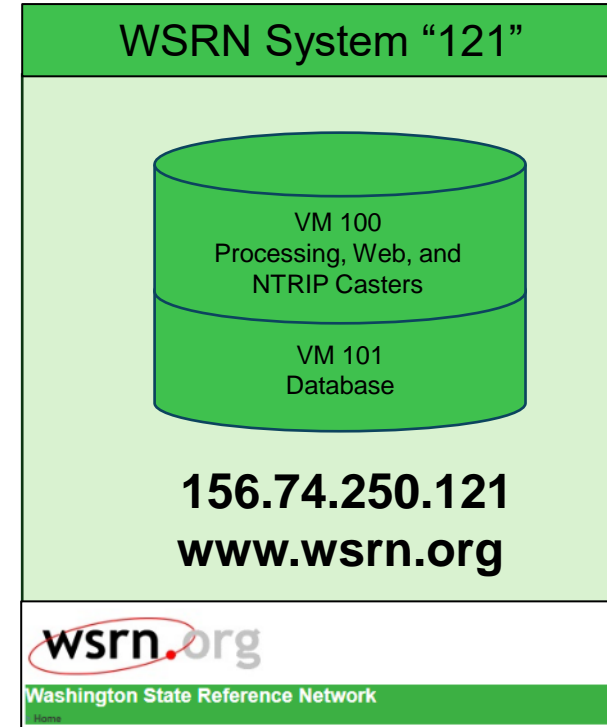
Planned WSRN Transition System

WSRN System "108"

VM 102
Processing, Web, and
NTRIP Casters

VM 103
Database

156.74.250.108
www.wsrn3.org

Washington State Reference Network

Washington State Reference Network
Home › Sensor Map

WSRN System "X2011"

VM 104
Processing and NTRIP
Relays

VM 105
Database
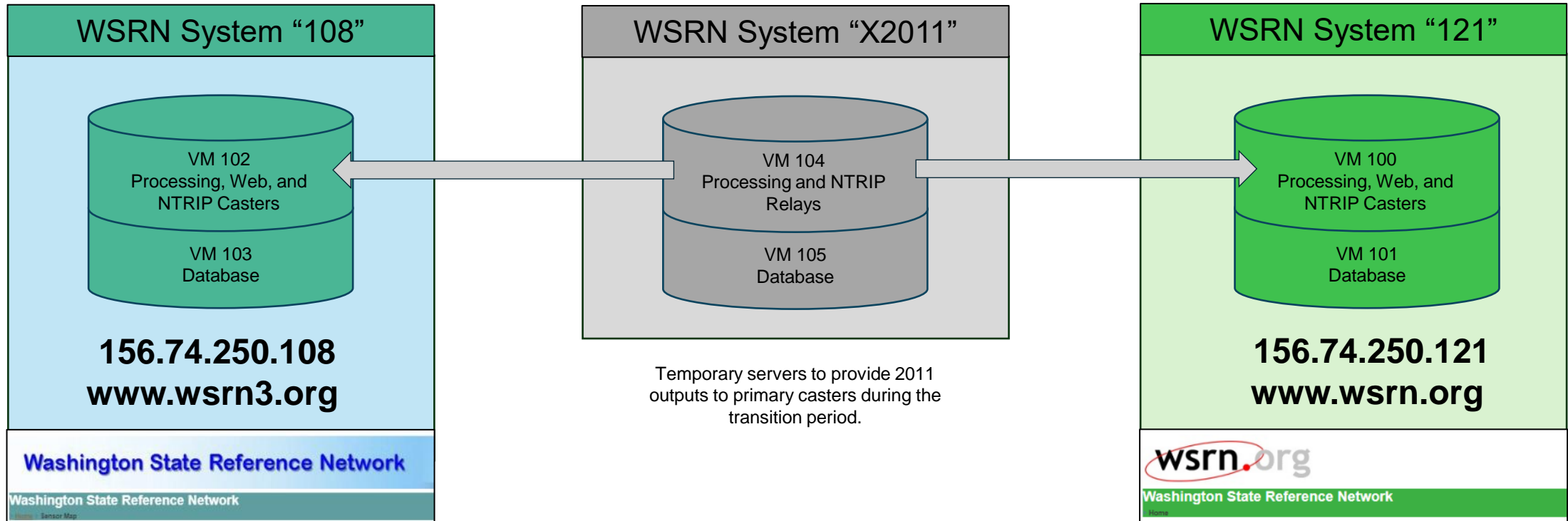
Temporary servers to provide 2011
outputs to primary casters during the
transition period.

WSRN System "121"

VM 100
Processing, Web, and
NTRIP Casters

VM 101
Database

156.74.250.121
www.wsrn.org

wsrn.org

Washington State Reference Network
Home

156.74.250.108:2011
www.wsrn3.org:2011
NAD83-2011 Epoch 2010.00
156.74.250.108:2022
www.wsrn3.org:2022
NATREF2022

156.74.250.121:2011
www.wsrn.org:2011
NAD83-2011 Epoch 2010.00
156.74.250.121:2022
www.wsrn.org:2022
NATREF2022

WSRN Plans for the Datum Transition

Prior to Transition:

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

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

Port 8080 = NAD83-2011 Epoch 2010.00

WSRN Plans for the Datum Transition

When the new datum launches…

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

Choose a datum by selecting the corresponding port:

Port 2022 = NATREF 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

**Online Post- Processing (WAPUS):**

- The WAPUS service on both websites will default to NATREF-2022 on the day of the launch
- A legacy WAPUS for NAD83-2011 is being explored for the 12–18-month transition period

Sitelogs, CSV and KML:

- NATREF-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 NATREF-2022 launch

Timeline for WSRN Datum Transition

- WSRN will complete Bluebooking of all stations by mid-2025

- When the NGS NATREF-2022 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 NATREF-200. NAD83-2011 will continue to run on the development server. Caster port 2022 will deliver NATREF-2022, and caster port 2011 will deliver NAD83-2011. Port 8080 will be retired.

- **12 Months after the launch**, NAD83-2011 will no longer be supported for subnets PACWA, NWWA, PRSN, and SWWA (due to plate velocity).

- **18 months after the launch**, NAD83-2011 will no longer be supported for the remaining subnets: EWA and SEWA (due to plate velocity).
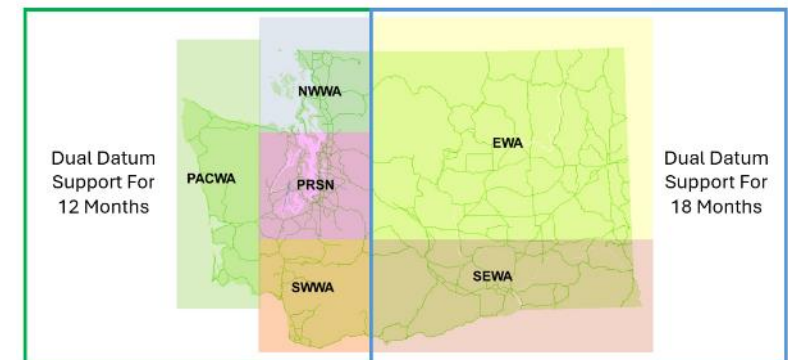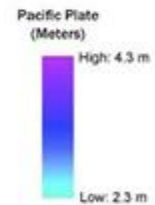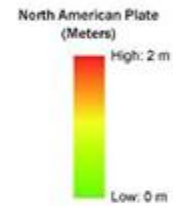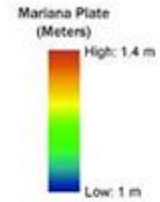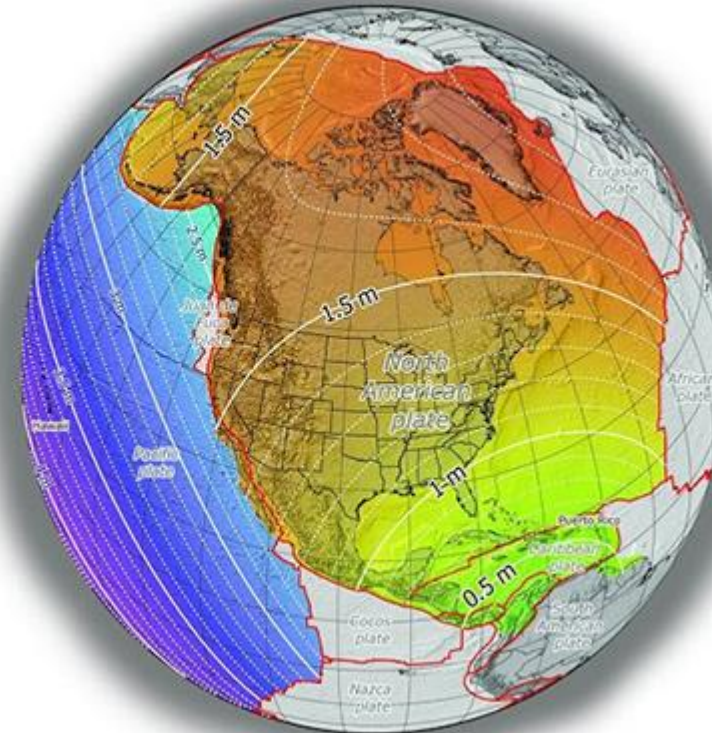
Planning for the Datum Change

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

Approximate Ellipsoid Height Change
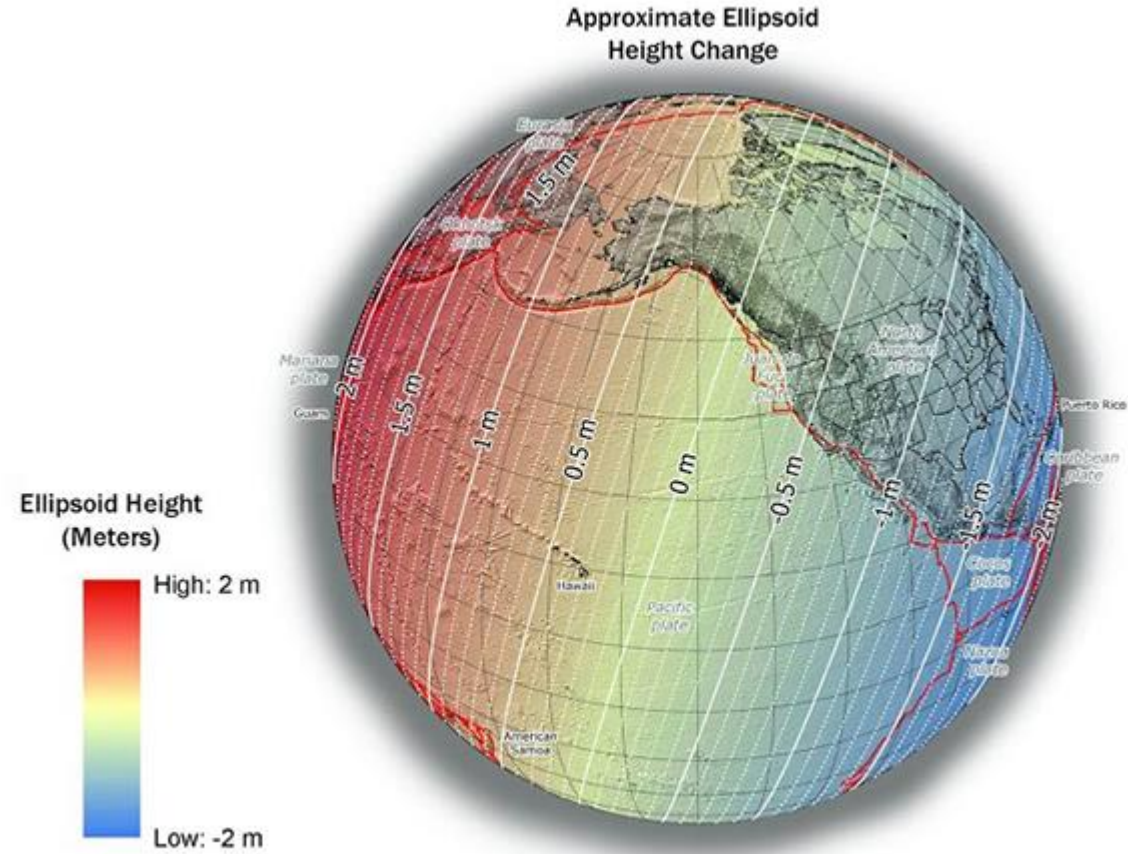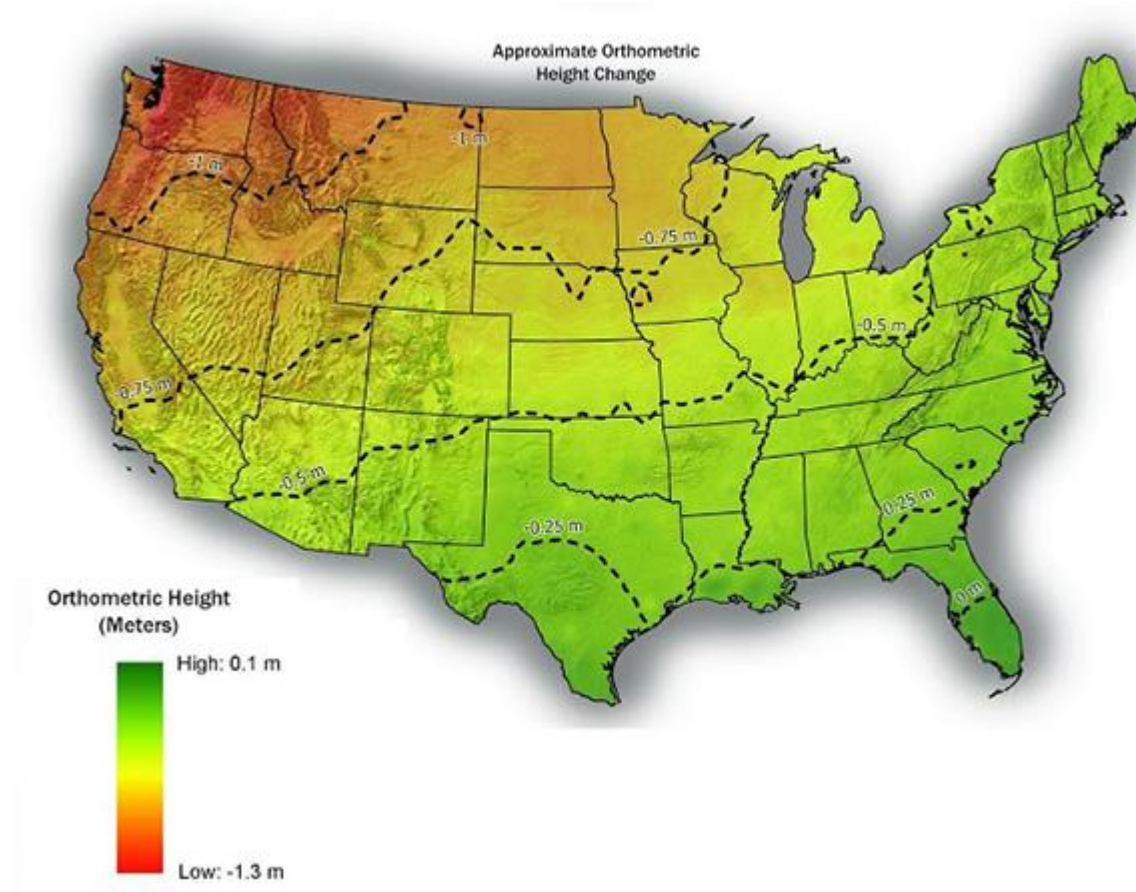
Planning for the Datum Change

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:

- Cold Turkey – all new projects on NATREF2022

- Localize to keep legacy projects working in NAD83-2011

- Use NGS Time Dependent Transformation tools to keep legacy projects working in NAD83-2011

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

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 will (as we get closer to the datum change) will have NATREF2022 vales 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".

PPP as a Check
As the default values output by many PPP services (ITRF) will initially be coincident with NATREF2022, quick real-time or post-processed PPP is a good check.

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