

New Geometric Datum

- Cartesian coordinate system
- Designed to be Earth Centered, Earth Fixed (ECEF)
- Positions represented as an X,Y,Z set with (0,0,0) located at the origin of the coordinate system – center of the Earth
- Allow for individual plate motions
- Coordinates will have velocity components

- WGS 84 and IGS08 are ECEF systems
- NAD 83 is a plate-fixed system – North American plate
- 3-4 foot magnitude difference between NAD 83 and WGS 84 / IGS

- Define new SPC system?

New Geopotential Datum

- The current North American Vertical Datum of 1988 (NAVD 88)
 - is a minimally constrained adjustment of a massive leveling campaign performed in the 1980's
 - NAVD 88 is internally consistent but has a significant mismatch with MSL
- The new datum will be accessed via GNSS technology versus benchmarks
- New vertical datum to be released in 2022 will be based upon a gravimetric geoid
- Airborne gravity data collected by the Gravity for the Redefinition of the American Vertical Datum (GRAV-D) project will allow for blending of data from satellite, altimetric, and surface sources
- The datum will be updated to reflect temporal change

State Plane Coordinates

Originally designed to provide coordinates on a flat grid. The United States has over a 124 distinct grids known as “zones.”

- Each state has one or more zones (SPC zones) in a single layer configuration
- Northings & eastings computed from the latest realization of NAD 83 coordinates
- Output in U.S. Survey Foot / International Foot
- NGS currently maintains and supports a one layer zone system
- NGS policy on State Place Coordinates
- Low-distortion projects – many zones per state; multiple layers

How the New Datums Will Affect You

- New geometric datum will change latitude, longitude, and ellipsoid height by between 1 and 2 meters.
- The new vertical datum will change heights on average 50 cm (20"), with a 1 meter (39") tilt towards the Pacific NW

What to Expect as Datums Roll Out

- Both datums will be released together
- NGS will provide tools to allow for easy transformation between the new and old datums
- We expect to assign values to all BMs that have GPS observations
- NGS will develop standards and specifications for how to best blend the controlled leveling survey with the new methods of accessing the datum