Standard 161.01 - Geodetic Control Data Standard

Purpose

These standards establish and reference Geodetic Control Data Standards for vertical datum, horizontal datum, and the state’s coordinate system used for agency geospatial data, geographic information systems, and data exchanges.

They are designed to improve data quality and accuracy, and simplify the exchange of geodetic control data among state agencies, local, tribal, state, and federal users and producers.

Statutory Authority

The provisions of RCW 43.105.041 detail the powers and duties of the Technology Services Board (TSB), including the authority to develop statewide or interagency information services and technical policies, standards, and procedures.

Scope and Exemptions

These standards apply to state of Washington executive branch agencies, agencies headed by separately elected officials, and institutions of higher education referred to as “agencies” throughout this document. Academic and research applications at institutions of higher education are exempt.

Standard

Agencies shall use the following Geodetic Control Data Standards for significant new or redesigned agency geospatial datasets, geographic information systems, and data exchanges.

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| **Geodetic Control** | **State Standard** | **Owner/**  **Primary Steward** |
| Horizontal Datum | NAD 83/91 - North American Datum of 1983, with 91 adjustments | NGS |
| State Plane Coordinate System | Washington Coordinate System of 1983 | DNR |
| Vertical Datum | NAVD 88 - North American Vertical Datum of 1988 | NGS |

**1. Horizontal Datum**

The North American Datum 1983 (NAD 83), with 1991 (NAD 83/91) adjustments shall be the state standard for Horizontal Datum.

* Reference datum and adjustments in metadata.

**2. Projected Coordinate System (PCS)**

**2.1. State Plane Coordinate System (SPCS)**

* The Washington Coordinate System of 1983 shall be the coordinate system in Washington, per RCW 58.20.120, System designation – Permitted uses.

**2.2. Unit of Measure and Conversion**

* The Standard unit of measure is the U.S. Survey Foot.
* For conversion of coordinates between the meter and the United States survey foot, the meter shall equal exactly 39.37 inches, per RCW 58.20.190 Conversion of coordinates - Metric.

2.3. South Zone (FIPS: 4602; WKID: 2927)

* Use South Zone for Statewide Layers and for layers that are in both the South and North Zones.
* Use South Zone for layers that are not in the North Zone.  The area now included in the following counties shall constitute the south zone: Adams, Asotin, Benton, Clark, Columbia, Cowlitz, Franklin, Garfield, that part of Grant lying south of parallel 47° 30' north latitude, Grays Harbor, Kittitas, Klickitat, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, Wahkiakum, Walla Walla, Whitman and Yakima.

2.4. North Zone (FIPS: 4601; WKID: 2926)

* Use North Zone for layers that are not in the South Zone.  The area now included in the following counties shall constitute the north zone: Chelan, Clallam, Douglas, Ferry, Island, Jefferson, King, Kitsap, Lincoln, Okanogan, Pend Oreille, San Juan, Skagit, Snohomish, Spokane, Stevens, Whatcom, and that part of Grant lying north of parallel 47° 30' north latitude.

**3. Vertical Datum**

The North American Vertical Datum of 1988 (NAVD 88) shall be the state standard for Vertical Datum.

**Conversion and Adjustment Tools**

* NGS Geodetic Tool Kit provides various free online interactive and downloadable software programs and tools for computing, converting, and adjusting geospatial data.<http://www.ngs.noaa.gov/>
* VDatum is a free software tool designed to vertically transform geospatial data among a variety of tidal, orthometric and ellipsoidal vertical datums.
* <http://vdatum.noaa.gov/>

**Key Terms**

**Geodetic Control** – Set of control points whose coordinates are established by geodetic surveying methods such as classical line-of-sight triangulation, traverse, geodetic leveling, and gravimetric or satellite surveys such as Doppler or GPS.

The newer technologies have resulted in more accurate horizontal and vertical control points on the earth’s surface and serve as the basis for current vertical and horizontal datum.

**Horizontal Datum** – A reference surface against which locations on the earth are described, most commonly using latitude and longitude coordinates. They serve as the basis for coordinate systems including the Washington State Plane Coordinate System.

**Geographic Coordinate Systems (GCS) –**Use a three-dimensional spherical surface to define locations on the earth.  A point is referenced by its longitude and latitude values.

**Projected Coordinate Systems (PCS)** - Are defined on a flat, two-dimensional surface and always based on a GCS.

**State plane coordinate systems** **(SPCS)** - Are PCS designed for applications within a state. Washington is divided into two zones - North and South.

**Vertical Datum** – A reference surface against which elevation and depth are measured on the earth's surface.

Revision History

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| **Date** | **Version** | **Editor** | **Action taken** |
| July 26, 2019 | 1.1 | Joanne Markert, OCIO | Sunset review, minor updates. Adopted by state CIO |
| December 21, 2010 | 1.0 | Joy Paulus, DIS | Assigned a standards number and adopted by the Information Services Board |

CONTACT INFORMATION

Contact the [OCIO Policy & Waiver Mailbox](mailto:ocio.policy@ocio.wa.gov?subject=Policy%20184%3A%20Data%20Center%20Investment%20%20Info%20or%20Waiver%20Request) for questions on policy and standards.

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APPROVING AUTHORITY: Jim Weaver, State CIO & Chair TSB