IMPACT OF NAD83 (CSRS) ADOPTION

Introduction

On August 1 1999, the published coordinates of a subset of survey control markers in Alberta will be referred to the North American Datum 1983/Canadian Spatial Reference System [NAD83 (CSRS)]. This supersedes the NAD83 (Original) datum. This fact sheet reviews the impact of the new determination of the NAD83 datum on survey control users and others dealing with position-based data in Alberta.

NAD83 Differences

The ellipsoid associated with NAD83 (Original) is the Geodetic Reference System 1980. At the time of its initial realisation, NAD83 (Original) was intended to be geocentric system and was compatible with other geocentric systems of the time, namely WGS84. With the use of more accurate techniques and better solutions, it is now known that NAD83 (Original) is offset by about 2 m from the geocenter. The best geocentric reference frame currently available is the International Terrestrial Reference Frame (ITRF). The NAD83 (CSRS) datum is based on ITRF which will provide better compatibility with modern satellite-based surveys.

Coordinate Differences

On average, the NAD83 (CSRS) coordinates of Alberta Survey Control Markers (ASCMs) will differ from current NAD83 (Original) values by approximately 0.20m. Note that this is average only; the actual difference does vary throughout the province.

Federal Adoption

To comply with the International Association of Geodesy (IAG) recommendations, Canada and the US have adopted a common similarity transformation between ITRF96 and NAD83 (Original), which effectively provides a unified definition of NAD83 throughout both countries. This realisation of NAD83 is referred to as NAD83 (CSRS) in Canada and NAD83 (NSRS) in the US.

Provincial Adoption

In Alberta, Geodetic Control adopted and published NAD83 (CSRS) coordinates for a selected subset of ASCMs in August 1999. As users move to NAD83 (CSRS) as the geodetic spatial referencing system in Alberta, NAD83 (Original) coordinates will no longer be rigorously computed for new ASCMs. This transition is expected to take a number of years in which both NAD83 (Original) and NAD83 (CSRS) coordinate values will be derived. It is noted that NAD83 (CSRS) coordinate values will only be derived for new markers that are a part of the ASCM CSRS subset.

Impact on Land Surveys

NAD83 (CSRS) defines the national standard for referencing spatial data in Canada. It serves as the link between Geographic Information System (GIS), Global Positioning System (GPS) positions and the Canadian Geospatial Data Infrastructure (CGDI). By using NAD83 (CSRS) products, it is ensured that the data is compatible with a modern, high-accuracy reference system and can be exchanged and merged without complication.

Phase-out of NAD83(Original)

Survey control users and others dealing with position-based data should consider adopting NAD83 (CSRS). Data gathered using modern surveying techniques referred to NAD83 (CSRS) can be merged and exchanged in a seamless manner. Although Geodetic Control will continue to make coordinates available for ASCMs on both NAD27 and NAD83 (Original) datums, they will not be rigorously maintained and any position-based data that remains referenced to any previous datums will become dated and may be difficult to integrate with other data.

More Information

This fact sheet is one of a series published by Lands Division, Geodetic Control Unit. For more information, please visit our web site at:
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