

CSRS Modernization: A new Coordinate Reference System for Canada

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Abstract:

The Canadian Spatial Reference System (CSRS) defines latitude, longitude, and heights in Canada, providing the foundation for all types of geospatial data. On a dynamic earth, these standards require constant monitoring and updating to keep pace with evolving technologies and geospatial data accuracy requirements. Currently, the federally adopted coordinate reference system is the North American Datum of 1983 of the CSRS (NAD83(CSRS)).

The United States' National Geodetic Survey (NGS) plans to modernize their National Spatial Reference System (NSRS) in 2026, including adopting a new dynamic geometric reference called the North American Terrestrial Reference Frame of 2022 (NATRF2022). To ensure continued (and improved) compatibility, the Canadian Geodetic Survey (CGS) will adopt NATRF2022 in parallel with the US. NATRF2022 and a new model defining heights above sea level (see Foroughi et al) is being developed through a binational collaboration between CGS and NGS.

Modernizations of this magnitude occur roughly every 50-100 years. In Canada, CGS coordinates these updates with the provinces through the Canadian Geodetic Reference System Committee (CGRSC). Most CGRSC members are now working towards the adoption of NATRF2022 in the provinces by 2030. If successful, this will mark the first time that federal and provincial governments will have formally adopted unified reference systems across all jurisdictions since before the use of GPS became widespread. Migrating to the new systems will require effort; but working in a unified coordinate reference system across all Canadian jurisdictions and with the US promises to reduce the risk of blunders, improve data interoperability, and provide significant efficiencies.

In this presentation and discussion, we will describe the motivation for this move, and timelines for modernization, including the release of new products between now and 2026. The presentation will highlight opportunities and challenges for the geospatial and mapping communities in particular.

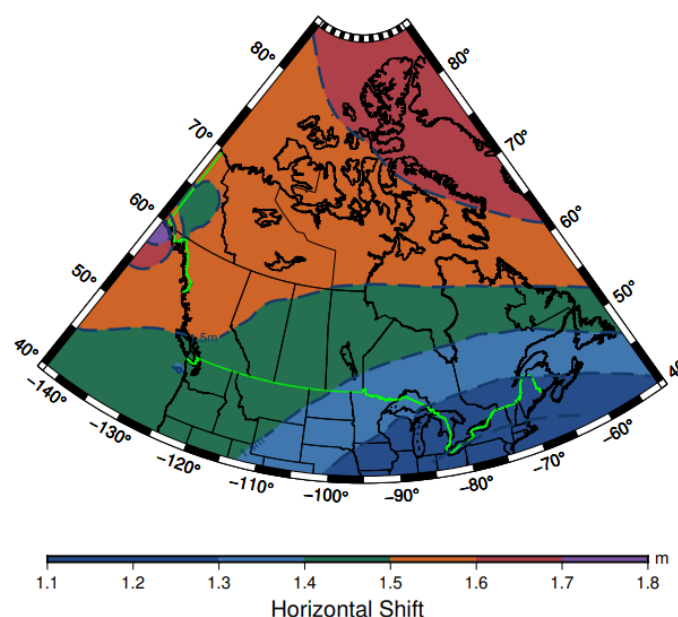


Figure 1. Estimate of the expected horizontal differences between NAD83(CSRS) and NATRF2022 in Canada...

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