Reference System Modernization in Canada

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SUMMARY

The United States National Geodetic Survey (NGS), as part of its reference system modernization, is planning to adopt a new geometric reference frame for the U.S. in 2025, called the North American Terrestrial Reference Frame of 2022 (NATRF2022). This new reference frame will be based on ITRF2020 and separated from the North American Datum of 1983 (NAD83), the currently adopted frame in both Canada and the U.S., by up to 1.5 metres at the Canada-U.S. border. The Canadian Geodetic Survey (CGS) also plans to adopt NATRF2022 as a new national standard following U.S. adoption, and is collaborating with NGS to define and realise NATRF2022 to ensure reference frame compatibility across both countries. In parallel, CGS is leading an effort to adopt NATRF2022 as a unified reference frame across provincial and other Canadian jurisdictions, which have the authority to adopt reference systems used within their own jurisdictions. In this paper, we describe Canadian considerations for the definition and realisation of NATRF2022, and outline efforts and challenges in migrating to NATRF2022 as a unified reference system throughout all jurisdictions in Canada, and maintaining such unification in the future. We will also discuss a new geoid-based height system called the North American-Pacific Geopotential Datum of 2022 (NAPGD2022), to be adopted by the U.S. together with NATRF2022, and its implications for Canada, where a geoid-based height system, the Canadian Geodetic Vertical Datum of 2013 (CGVD2013) has been in place since 2013.
