

Modernizing Regional Reference Frames in North America: Current and Future Activities of IAG Regional Sub-Commission SC1.3c

Michael Craymer (Natural Resources Canada), Daniel Roman (U.S. National Geodetic Survey) and Phillip McFarland (U.S. National Geodetic Survey)

Abstract. In collaboration with the IAG community, its service organizations and the national geodetic organizations of North America, the IAG Regional Sub-commission SC1.3c (Regional Reference Frames for North America) provides international focus, cooperation and coordination for issues involving the geodetic reference frames and control networks of North America. These issues include the establishment, maintenance, future evolution and inter-relation of reference frames throughout the continent, and the specification of consistent standards and guidelines. In order to realize these objectives, the Sub-commission has been organized into three working groups dealing with:

- (1) densification of the ITRF and IGS reference frames in North America (NAREF);
- (2) replacing the existing, non-geocentric NAD83 reference frame with new geocentric, ITRF2020-based, plate-fixed regional reference frames in North America (NATRF2022), the Caribbean (CATRF2022), and U.S. territories on the Pacific (PATRF2022) and Mariana plates (MATRF2022);
- (3) maintenance of the relationship between the existing NAD83 reference frame and the various versions of ITRF, including its IGS and WGS 84 realizations.

Over the last few years there have been many activities in all of these working groups, in particular, preparations for the implementation of the new ITRF2020-based reference frames. In particular, we highlight the fundamental work of defining the plate-fixed frame through an Euler pole rotation in ITRF2020, as well as GNSS reprocessing efforts in both Canada and the U.S. based on IGS Repro3 products and standards. Other important activities include updating to a new realization of NAD83 based on ITRF2020 to facilitate the transition to NATRF2022.