

The U.S. National Spatial Reference System in 2022

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SUMMARY

In 2022, the National Geodetic Survey (NGS) will be providing updated access to the U.S. National Spatial Reference System (NSRS). The NSRS is currently realized by the North American Datum of 1983 (NAD 83) and the North American Vertical Datum of 1988 (NAVD 88). These older datums have inherent flaws at the meter level and are no longer consistent with efforts envisioned by the United Nations subcommittee for the development of a Global Geodetic Reference Frame (UN-GGRF) nor the International Vertical Reference Frame. The update to the NSRS will involve the development of a new terrestrial frame more closely aligned with recent realizations of International Terrestrial Reference Frame, such as the forthcoming IGS14. Geometric coordinates defined within this new regional frame would be available throughout Central and North America. The intent is to provide cm-level accurate positioning from 15 minutes of GNSS observations. The observations would be processed using updated Online Positioning User Service software that allow other GNSS data besides GPS to be used as well as incorporating many elements of the existing adjustment software used by NGS. The movement of the frame will largely be captured by an Euler pole with residual velocities being modeled as well. The derived geometric coordinates would then be used to access a geopotential frame for determination of physical heights - both orthometric and dynamic. Again, efforts will be made to develop a geopotential model that is consistent across the region for all countries in Central and North America. Because the U.S. has states and territories outside of the CONterminous United States (CONUS), separate models will be developed for outlying areas including: Puerto Rico and the U.S. Virgin Islands, Hawaii, Guam and the Commonwealth of the Northern Mariana Islands, and American Samoa. To this end, four separate frames will be realized for North America plate, the Caribbean plate, the Pacific plate, and the Mariana plate. Working groups with IAG's commission 1 and 2 have been working to develop these models for broader regional collaboration specifically for Central and North America, but outreach efforts have also begun for collaboration in the Caribbean region as well.

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