

United States NSRS 2022: Terrestrial Reference Frames

Daniel Roman (USA)

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SUMMARY

In 2022, the United States will update National Spatial Reference System (NSRS) and replace the existing framework comprised of regional versions of NAD 83 and locally determined leveling datums. The new reference frames (geometric and geopotential) will rely primarily on Global Navigation Satellite Systems (GNSS) such as the Global Positioning System (GPS) as well as an updated and time-tracked geoid model. This paradigm will be easier and more cost-effective to maintain. There will be four frames realized in the major regions in which states and territories are located: North America (NATRF), the Caribbean (CATRF), the Pacific (PATRF) and the Mariana Islands (MATRF). In each of these frames, an Euler pole and Intra-Frame Velocity Model (IFVM) will be defined. Foundation CORS (FCORS) will be operated in all four of these frames and maintained directly or indirectly by NGS. The FCORS will aid in defining the frames and movement within the frames. This paper will focus on the selection of FCORS and their use in defining Euler pole parameters (EPP) for each of the frames. The IAG SC 1.3c WG on Stable North America was reconstituted to facilitate NATRF specifically but provided input for CATRF and PATRF. Coordination with an Asia-Pacific working group has begun to develop a collaborative model for PATRF and MATRF. Coordination as also begun with SIRGAS in the development of CATRF (IAG SC 1.3b). In particular, this paper will focus on the development of CATRF, selection of FCORS and EPP determination. With the impending 2022 deadline, many aspects of this update are being frontloaded to ensure optimal development of the terrestrial reference frames as well as sufficient outreach and communication.