

# **GEOID18: Last U.S. Hybrid Geoid Prior to NAPGD2022**

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## **SUMMARY**

The United States National Spatial Reference System will be updated in 2022 to be four terrestrial reference frames directly tied to the International Terrestrial Reference Frame and the North American-Pacific Geopotential Datum of 2022 (NAPGD2022) that will be based in those TRF's. Until then, the existing US NSRS will continue to be realized by the North American Datum of 1983 (NAD 83) and the North American Vertical Datum of 1988 (NAVD 88). These datums are maintained separately and realized separately. To connect them, so called "hybrid" geoid models are developed from an underlying gravimetric geoid and the GPS-derived ellipsoid heights on the spirit-levelled bench marks (GPSBM). Least Squares Collocation is used to warp the surface of a gravity-based geoid model to fit through over 30,000 GPSBM's. These gravity geoid provides continuity between the GPSBM to develop a consistent transformation between NAD 83 and NAVD 88 to facilitate work by surveyors around the country. Numerous recent collections were made as a part of a concerted effort to fill in gapped regions and provide a better spatial distribution for this model.

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