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Modernization of the National Spatial Reference System
Keeping Pace with Changes in Positioning Technology and User Expectations in a Dynamic World

During the next decade, enhancements and additions to the network of Global Navigation Satellite Systems (GNSS) including the U.S. NAVSTAR Global Positioning System, Russian GLONASS, European Union GALILEO and China's BeiDou will significantly improve the use of space-based positioning systems for surveying, mapping, charting, navigation and innumerable other applications. In order to meet the anticipated demands for an improved geospatial framework that these developments will require, the National Geodetic Survey (NGS) is implementing a plan for the modernization of the National Spatial Reference System (NSRS). Among the various topics outlined in this plan is the adoption of an entirely new geodetic reference frame with updated geometric (horizontal) and gravimetric (vertical) realizations that will replace the North American Datum of 1983 (NAD 83), the North American Vertical Datum of 1988 (NAVD 88) and the several island vertical datums. The new framework will be designed such that the geometric component (latitude, longitude, ellipsoid height) will be virtually identical to and aligned with the International Terrestrial Reference Frame (ITRF), while orthometric heights will be based exclusively on a nation-wide high accuracy (1-2 cm) gravimetric geoid model. This presentation highlights the rationale for these changes, the various elements that currently define the NSRS and the activities NGS is engaged in to improve the capacity of and access to the NSRS in support this transition including tools such as OPUS and DSWorld.