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National Geodetic Survey (NGS) Policy for the North American Datum of 1983 Readjustment of the Horizontal and Ellipsoid Height Components of the National Spatial Reference System

Background

In order to meet NGS' responsibility to improve and maintain the National Spatial Reference System (NSRS), the existing coordinate reference frame must be continually evaluated to provide the accessibility and high accuracy required for use with the Global Positioning System (GPS).

Between 1987 and 1997, NGS has been aggressively updating the horizontal and ellipsoid height components of NSRS through the development and implementation of the statewide High Accuracy Reference Networks (HARNs). The addition of Continuously Operating Reference Stations (CORS) to NSRS since 1995 has enhanced the quality of recent HARNs and highlighted areas of remaining horizontal network distortions as large as 10 cm and ellipsoid height distortions that exceed 20 cm in some networks observed prior to 1995.

- With the completion in 1997 of the last state-wide HARN, NGS can now provide a unified National adjustment of all GPS observations in NSRS, independent of the conventional triangulation network, consisting of:
 1. Continuously Operating Reference Stations (CORS)
 2. Federal Base Network (FBN)
 3. Cooperative Base Network (CBN)
 4. Eastern Strain Network surveys
 5. Area Navigation Approach (ANA) airport surveys
 6. Federal Base Network (FBN) Height Modernization reobservations
 7. User Densification Network (UDN) GPS surveys
- The implementation of a national readjustment must be based on the following considerations:
 1. The national FBN reobservation program is designed to support the maintenance of FBN with specific emphasis on improving ellipsoid heights under the Height Modernization effort.
 2. Given current NGS field resources, NGS should be able to complete the reobservations in approximately 4 years (by 2002).
 3. An analysis of the 1996 Eastern Strain Network and subsequent readjustment of part of the Atlantic coast area indicates that there are areas of the country with significant (5-7 cm) differences between the current horizontal positions of the HARN and CORS network.
 4. Ellipsoid heights at the FBN/CBN stations are the most suspect component of the position elements.

While it would be preferable to wait until all the FBN reobservations are completed prior to any readjustments, that may not be practical due to technical or political considerations.

It is recognized that to readjust significant portions of FBN immediately following the reobservations and then readjust them again when all FBN reobservations are completed (in approximately 2002) would create confusion and would be unacceptable to most users.